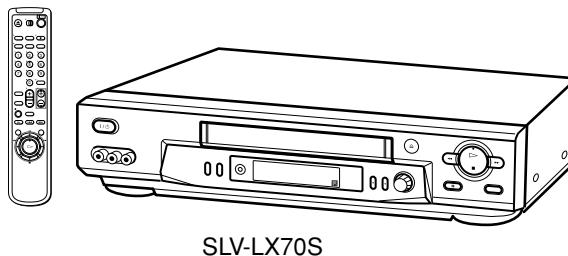


LX40/LX50/LX60S/LX70S

RMT-V293A/V294A

SERVICE MANUAL



SLV-LX70S

Chilean Model

SLV-LX50CL/LX50CS/LX70SCL/
LX70SCS

Mexican Model

SLV-LX40MX/LX50MX/LX60SMX/
LX70SMX

Panama Model

Venezuelan Model

SLV-LX50PA/LX50PC/LX50VZ/
LX70SPA/LX70SPC/LX70SVZ

S MECHANISM



Hi-Fi

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT VI for MECHANICAL ADJUSTMENTS.
(9-921-748-11)

HiFi model : SLV-LX60S/LX70S
Mono model: SLV-LX40/LX50

SPECIFICATIONS

System

Format
VHS NTSC standard

Video recording system
Rotary head helical scanning FM system

Video heads
Double azimuth four heads

Video signal
NTSC color, EIA standards

Tape speed
SP: 33.35 mm/s
EP: 11.11 mm/s
LP: 16.67 mm/s,
playback only

Maximum recording/playback time
9 hrs. in EP mode (with T-180 tape)

Fast-forward and rewind time
Approx. 3 min. (with T-120 tape)

Tuner section

Channel coverage
VHF 2 to 13
UHF 14 to 69
CATV A-8 to A-1, A to W, W+1 to W+84

Antenna
75-ohm antenna terminal for VHF/UHF

Input and outputs

LINE-1 IN and -2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jacks (1 each) (SLV-LX50 and LX40), (2 each) (SLV-LX70S and LX60S)
Input level: 327 mVrms
Input impedance: more than 47 kilohms

LINE OUT

VIDEO OUT, phono jack (1)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jacks (1 each) (SLV-LX50 and LX40), (2 each) (SLV-LX70S and LX60S)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

16 W

(SLV-LX50 (CL/CS/MX/PA/PC/VZ) and
SLV-LX40 (MX))

Operating temperature

5°C to 40°C (41°F to 104°F)

Storage temperature

-20°C to 60°C (-4°F to 140°F)

Dimensions

Approx. 355 x 96 x 288.8 mm (w/h/d)
including projecting parts and controls

Mass

Approx. 3.6 kg

Supplied accessories

Remote commander (1)
Size AA (R6) batteries (2)
75-ohm coaxial cable with F-type connectors (1)
Audio/video cable (1) (3-phono to 3-phono)
(SLV-LX70S and LX60S only)
Plug adaptor (1)
(SLV-LX70S (CL/CS) and LX50 (CL/CS) only)

Design and specifications are subject to change
without notice

ENERGY STAR® is a U.S. registered mark.

As an ENERGY STAR® Partner, Sony Corporation
has determined that this product meets the
ENERGY STAR®



VIDEO CASSETTE RECORDER
SONY®

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

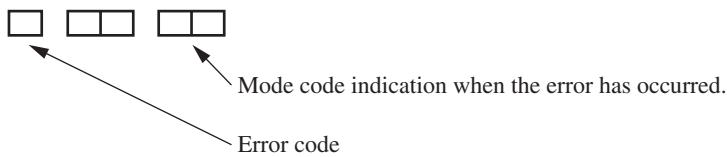
TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>	<u>Section</u>	<u>Title</u>	<u>Page</u>																																																																																																																																																																		
SERVICE NOTE																																																																																																																																																																							
1.	ERROR CODE INDICATION	5	<ul style="list-style-type: none"> • MA-405 (4/79)(AUDIO PROCESS) SCHEMATIC DIAGRAM 																																																																																																																																																																				
1 GENERAL																																																																																																																																																																							
Getting Started	1-1	1-13	• MA-405 (5/7)(TUNER) SCHEMATIC DIAGRAM	4-15																																																																																																																																																																			
Step 2 : Setting up the remote commander	1-1	1-1	• MA-405 (6/7)(DISPLAY CONTROL) SCHEMATIC DIAGRAM	4-17																																																																																																																																																																			
Step 3 : Hookups	1-1	1-1	• MA-405 (7/7)(POWER SUPPLY) SCHEMATIC DIAGRAM	4-19																																																																																																																																																																			
Selecting a language	1-4	1-4	• FJ-32 (LINE-2 IN) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM	4-23																																																																																																																																																																			
Setting the clock	1-4	1-4	• DI-80 (DIAL TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM	4-24																																																																																																																																																																			
Presetting channels	1-6	1-6																																																																																																																																																																					
Basic Operations	1-8	1-8																																																																																																																																																																					
Playing a tape	1-8	1-8																																																																																																																																																																					
Recording TV programs	1-8	1-8																																																																																																																																																																					
Recording TV programs using the Dial Timer	1-9	1-9																																																																																																																																																																					
Recording TV programs using the Timer	1-10	1-10																																																																																																																																																																					
Additional Operations	1-11	1-11																																																																																																																																																																					
Locking the VCR (Child Lock)	1-11	1-11																																																																																																																																																																					
Playing/searching at various speeds	1-11	1-11																																																																																																																																																																					
Setting the recording duration time	1-12	1-12																																																																																																																																																																					
Checking/changing/canceling timer settings	1-12	1-12																																																																																																																																																																					
Recording stereo and bilingual programs	1-13	1-13																																																																																																																																																																					
Searching using for the begining of a timer recorded program	1-13	1-13																																																																																																																																																																					
Searching using the index function	1-13	1-13																																																																																																																																																																					
Searching using the time search function	1-14	1-14																																																																																																																																																																					
Skip-searching automatically (Quick view)	1-14	1-14																																																																																																																																																																					
Searching for a selected point on the tape	1-14	1-14																																																																																																																																																																					
Adjusting the picture	1-15	1-15																																																																																																																																																																					
Changing menu options	1-15	1-15																																																																																																																																																																					
Editing with another VCR	1-16	1-16																																																																																																																																																																					
Additional Information	1-16	1-16																																																																																																																																																																					
General setup information	1-16	1-16																																																																																																																																																																					
Index to parts and controls	1-18	1-18																																																																																																																																																																					
2 DISASSEMBLY																																																																																																																																																																							
2-1.	CASE, FRONT PANEL BLOCK ASSEMBLY	2-1	6-1	MECHANICAL ADJUSTMENTS	6-1																																																																																																																																																																		
2-2.	DI-80 BOARD, FJ-32BOARD	2-1	6-2	ELECTRICAL ADJUSTMENTS	6-1																																																																																																																																																																		
2-3.	REAR PANEL	2-2	2-1.	PREPARATION BEFORE ADJUSTMENT	6-1																																																																																																																																																																		
2-4.	MA-405 BOARD	2-2	2-1-1.	Equipment Required	6-1																																																																																																																																																																		
2-5.	MECHANISM DECK	2-3	2-1-2.	Equipment Connection	6-1																																																																																																																																																																		
2-6.	INTERNAL VIEWS	2-4	2-1-3.	Set-up of Adjustment	6-1																																																																																																																																																																		
2-7.	CIRCUIT BOARDS LOCATION	2-5	2-1-4.	Alignment Tape	6-1																																																																																																																																																																		
3 BLOCK DIAGRAMS																																																																																																																																																																							
3-1.	OVERALL BLOCK DIAGRAM	3-1	2-1-5.	Input/Output Levels and Impedance	6-2																																																																																																																																																																		
3-2.	VIDEO BLOCK DIAGRAM	3-3	2-1-6.	Adjustment Sequence	6-2																																																																																																																																																																		
3-3.	SERVO/SYSTEM CONTROL BLOCK DIAGRAM	3-5	2-2.	POWER SUPPLY CHECK	6-2																																																																																																																																																																		
3-4.	TUNER BLOCK DIAGRAM	3-7	2-2-1.	Output Voltage Check (MA-405 Board)	6-2																																																																																																																																																																		
3-5.	AUDIO BLOCK DIAGRAM	3-9	2-3.	SERVO SYSTEM CHECK	6-3																																																																																																																																																																		
3-6.	POWER BLOCK DIAGRAM	3-11	2-3-1.	RF Switching Position Adjustment (MA-405 Board)	6-3																																																																																																																																																																		
4 PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS																																																																																																																																																																							
4-1.	FRAME SCHEMATIC DIAGRAM	4-3	2-4.	AUDIO SYSTEM ADJUSTMENT	6-3																																																																																																																																																																		
4-2.	PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS	4-5	2-4-1.	Hi-Fi Audio System Adjustment (Hi-Fi model only)	6-3																																																																																																																																																																		
	• MA-405 (VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER, POWER) PRINTED WIRING BOARD	4-5	2-4-2.	HiFi Switching Position Adjustment (MA-405 Board)	6-4																																																																																																																																																																		
	• MA-405 (1/7)(REC/PB HEAD AMP) SCHEMATIC DIAGRAM	4-7	2-4-3.	Normal Audio System Adjustment	6-4																																																																																																																																																																		
	• MA-405 (2/7)(Y/C, AUDIO PROCESS) SCHEMATIC DIAGRAM	4-9	2-4-4.	Audio Level and Distortion Check	6-4																																																																																																																																																																		
	• MA-405 (3/7)(SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM	4-11	2-4-5.	Audio Noise Check	6-4																																																																																																																																																																		
5 INTERFACE, IC PIN FUNCTION DESCRIPTION																																																																																																																																																																							
5-1.	SYSTEM CONTROL — MECHANISM BLOCK INTERFACE (MA-405 BOARD IC160)	5-1	2-4-6.	ACE Head Adjustment	6-4																																																																																																																																																																		
5-2.	SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-405 BOARD IC160)	5-1	2-4-7.	E-E Output Level Check	6-4																																																																																																																																																																		
5-3.	SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-405 BOARD IC160)	5-2	2-4-8.	Frequency Response Check	6-4																																																																																																																																																																		
5-4.	SYSTEM CONTROL AND RF MODULATOR — INPUT SELECTION BLOCK INTERFACE (MA-405 BOARD IC160)	5-2	2-5.	ADJUSTING PARTS LOCATION DIAGRAM	6-6																																																																																																																																																																		
5-5.	SYSTEM CONTROL — VIDEO/RP BLOCK INTERFACE (MA-405 BOARD IC160)	5-2	6 ADJUSTMENTS																																																																																																																																																																				
5-6.	SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-405 BOARD IC160)	5-2	5-7.	SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-405 BOARD IC160)	5-3	6-1	MECHANICAL ADJUSTMENTS	6-1				6-2	ELECTRICAL ADJUSTMENTS	6-1				2-1.	PREPARATION BEFORE ADJUSTMENT	6-1				2-1-1.	Equipment Required	6-1				2-1-2.	Equipment Connection	6-1				2-1-3.	Set-up of Adjustment	6-1				2-1-4.	Alignment Tape	6-1				2-1-5.	Input/Output Levels and Impedance	6-2				2-1-6.	Adjustment Sequence	6-2				2-2.	POWER SUPPLY CHECK	6-2				2-2-1.	Output Voltage Check (MA-405 Board)	6-2				2-3.	SERVO SYSTEM CHECK	6-3				2-3-1.	RF Switching Position Adjustment (MA-405 Board)	6-3				2-4.	AUDIO SYSTEM ADJUSTMENT	6-3				2-4-1.	Hi-Fi Audio System Adjustment (Hi-Fi model only)	6-3				2-4-2.	HiFi Switching Position Adjustment (MA-405 Board)	6-4				2-4-3.	Normal Audio System Adjustment	6-4				2-4-4.	Audio Level and Distortion Check	6-4				2-4-5.	Audio Noise Check	6-4				2-4-6.	ACE Head Adjustment	6-4				2-4-7.	E-E Output Level Check	6-4				2-4-8.	Frequency Response Check	6-4				2-5.	ADJUSTING PARTS LOCATION DIAGRAM	6-6	7 REPAIR PARTS LIST						7-1.	EXPLODED VIEWS	7-1	7-1-1.	FRONT PANEL AND UPPER CASE SECTION	7-1	7-1-2.	CHASSIS SECTION	7-2	7-1-3.	MECHANISM DECK SECTION-1	7-3	7-1-4.	MECHANISM DECK SECTION-2	7-4	7-1-5.	MECHANISM DECK SECTION-3	7-5	7-2.	ELECTRICAL PARTS LIST	7-6
5-7.	SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-405 BOARD IC160)	5-3	6-1	MECHANICAL ADJUSTMENTS	6-1																																																																																																																																																																		
			6-2	ELECTRICAL ADJUSTMENTS	6-1																																																																																																																																																																		
			2-1.	PREPARATION BEFORE ADJUSTMENT	6-1																																																																																																																																																																		
			2-1-1.	Equipment Required	6-1																																																																																																																																																																		
			2-1-2.	Equipment Connection	6-1																																																																																																																																																																		
			2-1-3.	Set-up of Adjustment	6-1																																																																																																																																																																		
			2-1-4.	Alignment Tape	6-1																																																																																																																																																																		
			2-1-5.	Input/Output Levels and Impedance	6-2																																																																																																																																																																		
			2-1-6.	Adjustment Sequence	6-2																																																																																																																																																																		
			2-2.	POWER SUPPLY CHECK	6-2																																																																																																																																																																		
			2-2-1.	Output Voltage Check (MA-405 Board)	6-2																																																																																																																																																																		
			2-3.	SERVO SYSTEM CHECK	6-3																																																																																																																																																																		
			2-3-1.	RF Switching Position Adjustment (MA-405 Board)	6-3																																																																																																																																																																		
			2-4.	AUDIO SYSTEM ADJUSTMENT	6-3																																																																																																																																																																		
			2-4-1.	Hi-Fi Audio System Adjustment (Hi-Fi model only)	6-3																																																																																																																																																																		
			2-4-2.	HiFi Switching Position Adjustment (MA-405 Board)	6-4																																																																																																																																																																		
			2-4-3.	Normal Audio System Adjustment	6-4																																																																																																																																																																		
			2-4-4.	Audio Level and Distortion Check	6-4																																																																																																																																																																		
			2-4-5.	Audio Noise Check	6-4																																																																																																																																																																		
			2-4-6.	ACE Head Adjustment	6-4																																																																																																																																																																		
			2-4-7.	E-E Output Level Check	6-4																																																																																																																																																																		
			2-4-8.	Frequency Response Check	6-4																																																																																																																																																																		
			2-5.	ADJUSTING PARTS LOCATION DIAGRAM	6-6																																																																																																																																																																		
7 REPAIR PARTS LIST																																																																																																																																																																							
7-1.	EXPLODED VIEWS	7-1																																																																																																																																																																					
7-1-1.	FRONT PANEL AND UPPER CASE SECTION	7-1																																																																																																																																																																					
7-1-2.	CHASSIS SECTION	7-2																																																																																																																																																																					
7-1-3.	MECHANISM DECK SECTION-1	7-3																																																																																																																																																																					
7-1-4.	MECHANISM DECK SECTION-2	7-4																																																																																																																																																																					
7-1-5.	MECHANISM DECK SECTION-3	7-5																																																																																																																																																																					
7-2.	ELECTRICAL PARTS LIST	7-6																																																																																																																																																																					

SERVICE NOTE

1. ERROR CODE INDICATION

- Error codes are indicated using the lower 5 digits in the fluorescent display tube.
“At this time, Colon “:” between character is not indicated.”



ERROR CODE

0	No error
1	Cam encoder error Loading direction
2	Cam encoder error Unloading direction
3	T reel error
4	S reel error
5	Capstan error
6	Drum error
7	Error on initializing
8	Cassette loading error
9	Reserve

MODE CODE

0	Power-on eject	10	FWD x1	20	REW play
1	Power-on initial	11	FWD x2	21	Cas. loading
2	Power-off eject	12	CUE	22	Tape loading
3	Power-off stop	13	PB-pause	23	Power-off loading
4	FF	14	RVS-pause	24	Mecha. error (Power on)
5	REW	15	RVS x1	25	Power-on eject initial
6	REC	16	RVS x2	26	Power-off eject initial
7	REC- pause	17	REV	27	APC REC
8	Power-on stop	18	Power-off initial	28	Cas. loading (No auto PB check)
9	PB	19	Mecha. error (Power off)		

SECTION 1 GENERAL

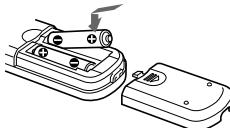
This section is a translated version of
Instruction Manual SLV-LX70S model
Part number: 3-065-284-12

Step 2 : Setting up the remote commander

Inserting the batteries

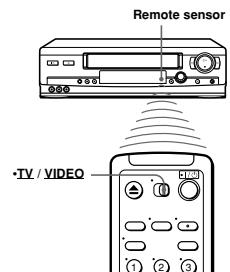
Insert two size AA (R6) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.

Insert the negative (-) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate this VCR and a Sony TV. Buttons on the remote commander marked with a dot (*) can be used to operate your Sony TV.



To operate	Set •TV / VIDEO to
the VCR	VIDEO and point at the remote sensor at the VCR
a Sony TV	•TV and point at the remote sensor at the TV

Notes

- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Controlling other TVs with the remote commander (SLV-LX70S and LX60S only)

The remote commander is preprogrammed to control non-Sony TVs. If your TV is listed in the following table, set the appropriate manufacturer's code number.

1 Set •TV / VIDEO at the top of the remote commander to •TV.

2 Hold down I/O and enter your TV's code number using the number buttons. Then release I/O.

Now you can use the I/O, VOL +/-, CH +/-, and TV/VIDEO buttons to control your TV. You can also use the buttons marked with a dot (*) to control a Sony TV. To control the VCR, reset •TV / VIDEO to VIDEO.

Code numbers of controllable TVs

If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

TV brand	Code number	TV brand	Code number	TV brand	Code number
Sony	01	JVC	09	RCA	04, 10
Akai	04	KMC	03	Sampo	12
AOC	04	Magnavox	03, 08, 12	Sanyo	11
Centurion	12	Marantz	04, 13	Scott	12
Coronado	03	MGA/Mitsubishi	04, 12, 13, 17	Sears	07, 10, 11
Curtis-Mathes	12	NEC	04, 12	Sharp	03, 05, 18
Daytron	12	Panasonic	06, 19	Sylvania	08, 12
Emerson	03, 04, 14	Philco	03, 04	Teknika	03, 08, 14
Fisher	11	Philips	08	Toshiba	07
General Electric	06, 10	Pioneer	16	Wards	03, 04, 12
Gold Star	03, 04, 17	Portland	03	Yorx	12
Hitachi	02, 03	Quasar	06, 18	Zenith	15
J.C.Penney	04, 12	Radio Shack	05, 14		

Notes

- If you enter a new code number, the code number previously entered will be erased.
- If the TV uses a different remote control system from the one programmed to work with the VCR, you cannot control your TV with the remote commander.
- When you replace the batteries of the remote commander, the code number may change. Set the appropriate code number every time you replace the batteries.
- When you press the AUDIO MONITOR button, your TV's menu may appear on the TV screen. To exit the TV menu, press the MENU button on the TV remote commander or wait until the menu disappears automatically.

continued

Setting up the remote commander 5

6 Setting up the remote commander

Step 3 : Hookups

Selecting the best hookup option

There are many ways in which your VCR can be hooked up. To hook up your VCR so that it works best for you, first scan through the table below. Then use the accompanying diagrams and procedures on the following pages to set up your VCR.

If your TV has audio/video inputs, refer to pages 8 and 9 for audio/video (A/V) hookup. Then follow one of the hookups below. If your TV doesn't have A/V inputs, go directly to one of the hookups below.

If you have	Use	Refer to
Antenna only, no cable TV	Hookup 1	Pages 10 to 11
No cable box or cable box with only a few scrambled channels	Hookup 2	Pages 12 to 14
Cable box with many scrambled channels	Hookup 3	Pages 15 to 17

After you've completed the connections, follow the instructions for setup. During setup, if you need more details on the procedure described, page numbers are provided where you can find complete, step-by-step instructions.

After you've completed the setup, you're ready to use your VCR. Procedures differ depending on the hookup you used. For an overview, refer to "Quick reference to using the VCR" on the back cover.

Before you get started

- Turn off the power to all equipment.
- Do not connect the AC power cords until all of the connections are completed.
- Be sure to make connections firmly. Loose connections may cause picture distortion.
- If your TV doesn't match any of the examples provided, see your nearest Sony dealer or qualified technician.

Audio/video (A/V) hookup

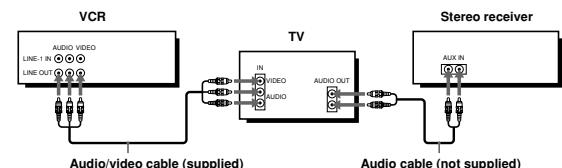
If your TV has audio/video (A/V) input jacks, you will get a better picture and sound if you hook up your VCR using these connections. If your TV doesn't have A/V inputs, see the following pages for antenna or cable hookups.

If you're not planning to use your VCR to record programs, you're finished setting up the VCR after you've made the connections shown on pages 8 and 9. If you want to record regular or cable TV programs, complete these connections first, and then go to the following pages for antenna or cable hookups.

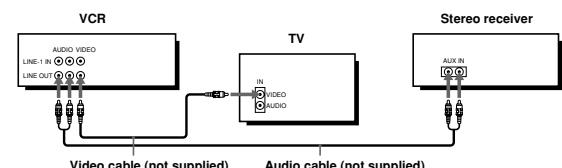
For SLV-LX70S and LX60S

For a true "home theater" experience, you should connect the audio outputs of your VCR or TV to your stereo system.

A Use this hookup if your TV has stereo jacks



B Use this hookup if your TV doesn't have stereo jacks

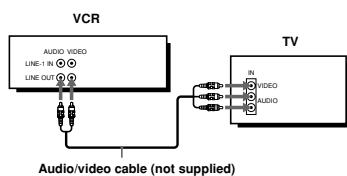


Notes

- If you don't have a stereo receiver, connect the white LINE OUT/AUDIO L jack to the AUDIO IN jack on your TV.
- To play a tape in stereo, you must use the A/V connection.
- If you use the Trinitron TV Syncro Play function (see page 34), the A/V connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)

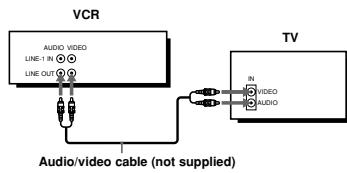
For SLV-LX50 and LX40

A Use this hookup if your TV has stereo jacks



Audio/video cable (not supplied)

B Use this hookup if your TV doesn't have stereo jacks



Audio/video cable (not supplied)

Note

- If you use the Trinitron TV Syncro Play function (see page 34), the A/V connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)

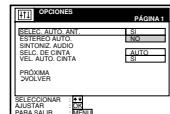
Completing A/V hookup

After you've connected your TV and completed antenna or cable hookup, return to this procedure to complete VCR set up. This will prevent unwanted noise in the RF channel.

Press MENU and select
OPCIONES.



Set SELEC. AUTO. ANT.
to NO and press OK.



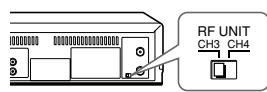
For details, see page 62.

Hookup 1 : VCR setup

Before you start...

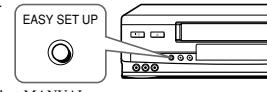
- Turn on the VCR and the TV.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67. If you made A/V connections (from page 8), you do not need to adjust the RF UNIT switch.



2 Change the on-screen display language to English, if desired. For details, see page 18.

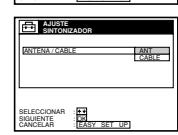
3 Press EASY SET UP on the VCR.



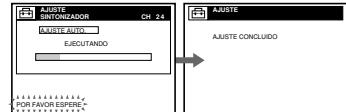
① The RELOJ menu appears. Select MANUAL and press OK. Then set the clock. For details, see page 24.



② The SINTONIZADOR menu appears. Set ANTENA/CABLE to ANT and press OK. For details, see page 26.



③ The AJUSTE AUTO. starts.



You have now completed hookup.

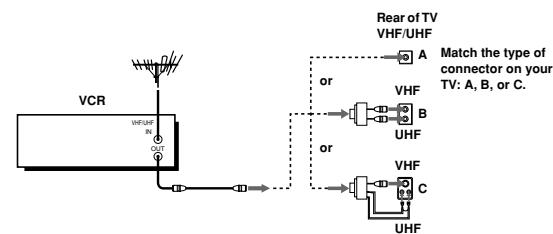
Hookup 1

Antenna hookup

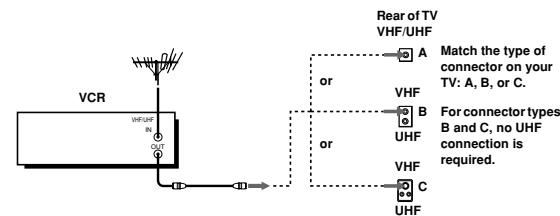
Make the following connections if you're using an antenna (if you don't have cable TV).

A Use this hookup if you're using:

- VHF/UHF antenna (you get channels 2-13 and channels 14 and higher)
- UHF-only antenna (you get channels 14 and higher)
- Separate VHF and UHF antennas



B Use this hookup if you're using a VHF-only antenna (you get channels 2-13 only)



If you cannot connect your antenna cable to the VCR directly

If your antenna cable is a flat cable (300-ohm twin lead cable), attach an external antenna connector (not supplied) so you can connect the cable to the VHF/UHF IN connector. If you have separate cables for VHF and UHF antennas, you should use a U/V band mixer (not supplied). For details, see page 68.

9 Hookups

10 Hookups

Hookup 2

You have no cable box, or a cable box with only a few scrambled channels

Recommended use

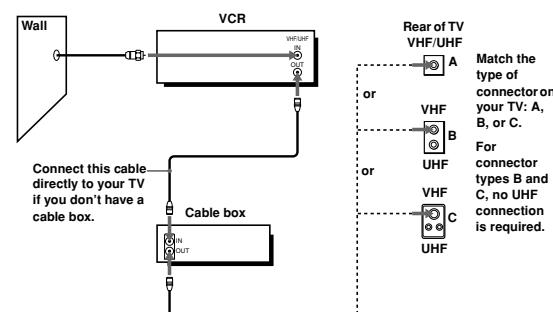
Use this hookup if you do not have a cable box. Also use this hookup if your cable system scrambles only a few channels.

What you can do with this hookup

- Record any unscrambled channel by selecting the channel on the VCR

What you can't do

- Record scrambled channels that require a cable box



11 Hookups

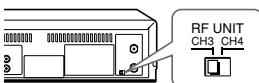
12 Hookups

Hookup 2 : VCR setup

Before you start...

- Turn on the VCR and the TV.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

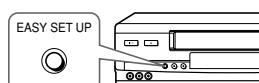
1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67.



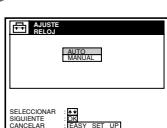
If you made A/V connections (from page 8), you do not need to adjust the RF UNIT switch.

2 Change the on-screen display language to English, if desired. For details, see page 18.

3 Press EASY SET UP on the VCR.

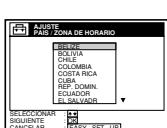


① The RELOJ menu appears. Select AUTO and press OK. For details, see page 20.



② The PAIS/ZONA DE HORARIO menu appears. Select the country you want to set and press OK. You can select the following countries:

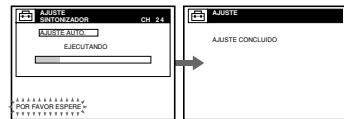
BELIZE ↔ BOLIVIA ↔ CHILE ↔
COLOMBIA ↔ COSTA RICA ↔ CUBA
↔ REP. DOMIN. ↔ ECUADOR ↔
EL SALVADOR ↔ GUATEMALA ↔
GUYANA ↔ HONDURAS ↔ JAMAICA
↔ MEX-CENTRO ↔ MEX-MONT. ↔
MEX-PACIF. ↔ MEX-S. ESTE ↔
NICARAGUA ↔ PANAMA ↔ PERU ↔
SURINAM ↔ TRIN. & TOB. ↔
VENEZUELA



③ The SINTONIZADOR menu appears. Set ANTENA/CABLE to CABLE and press OK. For details, see page 26.



④ The AJUSTE AUTO. starts.



You have now completed hookup.

Automatic clock setting

Once you've set up the VCR, it automatically sets the clock the first time you turn off the VCR. "ACS" (Auto Clock Set) will flash in the display window and search for a time signal provided by Sony Entertainment Television (SETV). After that, whenever you turn off the VCR, it checks the time and adjusts the clock, even for Daylight Saving Time.

If you want to use the timer to record right away, or if the cable TV station in your area does not broadcast SETV, or if SETV in your area does not carry time signals, set the clock manually. For details, see page 23.

Notes

- If the clock is not set, "ACS" will flash in the display window whenever the VCR is turned off. During this time, the VCR will search for a time signal.
- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select SI or NO for the HORARIO VERANO setting (page 22).

continued

13 Hookups

14 Hookups

Hookup 3 : VCR setup

Connecting a cable box with many scrambled channels

Recommended use

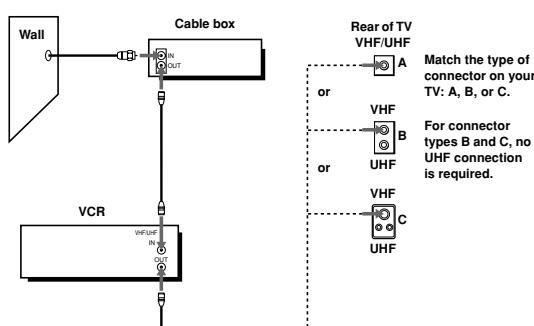
Use this hookup if your cable system scrambles all or most channels.

What you can do with this hookup

- Record any channel by selecting the channel on the cable box

What you can't do

- Record with the cable box turned off
- Record one channel while watching another channel

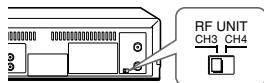


Hookup 3 : VCR setup

Before you start...

- Turn on the VCR and the TV.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

1 Set the RF UNIT switch to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel. For details, see page 67.

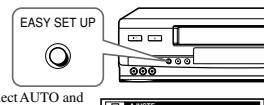


If you made A/V connections (from page 8), you do not need to adjust the RF UNIT switch.

2 Turn on your cable box.

3 Change the on-screen display language to English, if desired. For details, see page 18.

4 Press EASY SET UP on the VCR.

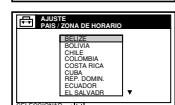


① The RELOJ menu appears. Select AUTO and press OK. For details, see page 20.



② The PAIS/ZONA DE HORARIO menu appears. Select the country you want to set and press OK. You can select the following countries:

BELIZE ↔ BOLIVIA ↔ CHILE ↔
COLOMBIA ↔ COSTA RICA ↔ CUBA
↔ REP. DOMIN. ↔ ECUADOR ↔
EL SALVADOR ↔ GUATEMALA ↔
GUYANA ↔ HONDURAS ↔ JAMAICA
↔ MEX-CENTRO ↔ MEX-MONT. ↔
MEX-PACIF. ↔ MEX-S. ESTE ↔
NICARAGUA ↔ PANAMA ↔ PERU ↔
SURINAM ↔ TRIN. & TOB. ↔
VENEZUELA



continued

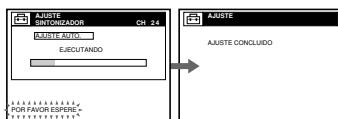
15 Hookups

16 Hookups

③ The SINTONIZADOR menu appears. Set ANTENA/CABLE to ANT and press OK. For details, see page 26.



④ The AJUSTE AUTO. starts.



Automatic clock setting

Once you've set up the VCR, it automatically sets the clock the first time you turn off the VCR. "ACS" (Auto Clock Set) will flash in the display window and search for a time signal provided by Sony Entertainment Television (SETV). After that, whenever you turn off the VCR, it checks the time and adjusts the clock, even for Daylight Saving Time.

To use the Auto Clock Set feature with this hookup, you need to manually select SETV:

- 1 Tune the cable box to SEITV.
- 2 Select AUTO in the RELOJ menu to turn on the Auto Clock Set feature.
- 3 Turn off the VCR. It automatically sets the clock and adjusts for Daylight Saving Time by picking up the time signal.

You have now completed hookup

If you want to use the timer to record right away, or if the cable TV station in your area does not broadcast SETV, or if SETV in your area does not carry time signals, set the clock manually. For details, see page 23.

Notes

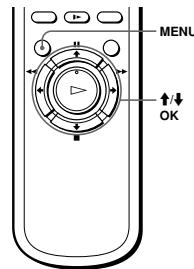
- To use the Auto Clock Set feature, leave the cable box on.
- If the clock is not set, "ACS" will flash in the display window whenever the VCR is turned off. During this time, the VCR will search for a time signal.
- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select SI or NO for the HORARIO VERANO setting (page 22).

Selecting a language

You can change the on-screen display language.

Before you start...

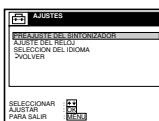
- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



1 Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.



AJUSTES



2 Press **↑/↓** to highlight SELECCION DEL IDIOMA, then press OK.



3 Press **↑/↓** to highlight ENGLISH or ESPAÑOL, then press OK.



Tip

- If you want to return to the previous menu, highlight VOLVER and press OK.

Setting the clock

Using the Auto Clock Set feature

Sony Entertainment Television (SETV) transmits time signals with its broadcasts. If the cable TV station in your area broadcasts SETV and transmits these time signals, your VCR can pick up these time signals to automatically set the clock.

The Auto Clock Set feature works only if SETV in your area broadcasts time signals. If SETV in your area does not broadcast time signals or if you select Hookup 1 on page 10 set the time manually (page 23).

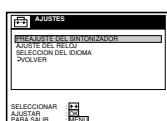
Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.

1 Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.



When using the EASY SET UP procedure, skip steps 1 and 2.



2 Press **↑/↓** to highlight AJUSTE DEL RELOJ, then press OK.



3 Press **↑/↓** to highlight AUTO, then press OK.



4 Press **↑/↓** to highlight TOTAL AUTO., then press OK.



5 Press **↑/↓** to highlight SI, then press OK.



6 Press MENU to exit the menu.



7 To activate the Auto Clock Set function, turn off the VCR. "ACS" will flash in the display window.

The VCR automatically sets the clock by searching for the SETV broadcast that carries time signals and sets Daylight Saving Time (if applicable).

If your clock is incorrectly set to Daylight Saving Time, you can adjust these settings without turning off the Auto Clock Set feature (page 21).

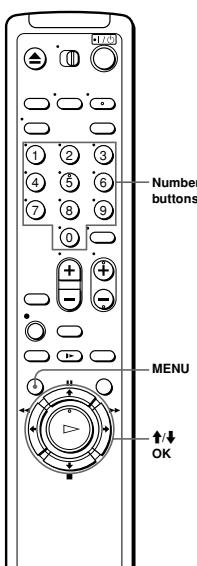
Tip

- If you want to return to the previous menu, highlight VOLVER and press OK.

Notes

- The clock cannot be set automatically if you don't receive SETV broadcast that carries time signals in your area. If so, set the clock manually (page 23).
- Depending on the channels allotted to SETV in your area, setting the clock automatically may take up to about 30 minutes. If nothing happens even after you wait about 30 minutes after turning off the VCR, turn the VCR on and then off again. If the clock is not set even after about another 30 minutes, set the clock manually (page 23).
- If the clock is not set, "ACS" will flash in the display window whenever the VCR is turned off. During this time, the VCR will search for a time signal.

If the clock does not activate



1 Follow steps 1 to 4 in "Using the Auto Clock Set feature."
The TOTAL. AUTO. menu is displayed.

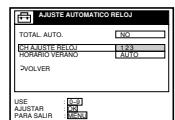


2 Press **↑/↓** to highlight NO for TOTAL. AUTO. and press OK.



3 Press **↑/↓** to highlight the item you want to set and press OK. Then press **↑/↓** to make the setting and press OK.

- For CH AJUSTE RELOJ
Leave the setting to "— —" to have the VCR automatically search for the SETV broadcast.
Or, press the number buttons to select the SETV channel if you know it.



- For HORARIO VERANO
Select SI or NO (standard time), or AUTO to have the VCR automatically set the daylight saving time.



4 Press MENU to exit the menu.



5 To activate the Auto Clock Set function, turn off the VCR. "ACS" will flash in the display window.

Tip

- If you want to return to the previous menu, highlight VOLVER and press OK.

Notes

- The Daylight Saving Time start and end days may differ depending on the year. To ensure correct switching, select SI or NO for the HORARIO VERANO setting.
- If nothing happens even after you wait about 30 minutes after turning off the VCR, turn the VCR on and then off again. If the clock is not set even after about another 30 minutes, set the clock manually (page 23).
- Some cable TV stations broadcasting SETV do not transmit time signals. If so, set the clock manually (page 23).

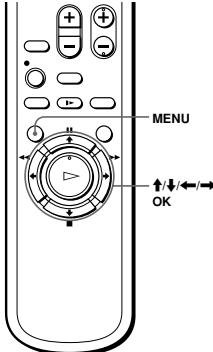
continued

Setting the clock | 21

Using Manual Clock Set

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



1 Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.

When using the EASY SET UP procedure, skip steps 1 and 2.



2 Press **↑/↓** to highlight AJUSTE DEL RELOJ, then press OK.

Press **↑/↓** to highlight AJUSTE DEL RELOJ, then press OK.



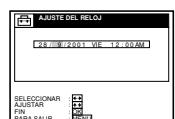
3 Press **↑/↓** to highlight MANUAL, then press OK.



4 Press **↑/↓** to set the day.



5 Press **→** to highlight the month and press **↑/↓** to set the month.



6 Set the year, hour, and minutes in the same way as the month.
The day of the week is set automatically.

7 Press OK to start the clock.



Tip

- If you want to return to the previous menu, highlight VOLVER and press OK.

continued

Setting the clock | 23

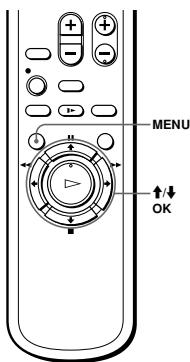
24 | Setting the clock

Presetting channels

This VCR is capable of receiving VHF channels 2 to 13, UHF channels 14 to 69 and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting methods. Then, if there are any unwanted channels, disable them manually. If you have already decided which channels you wish to preset, set them directly using manual presetting methods.

Before you start...

- Turn on the VCR and the TV.
- Set the TV to the VCR channel (channel 3 or 4). If your TV is connected to the VCR using A/V connections, set the TV to video input.
- Press TV/VIDEO to display the VIDEO indicator in the VCR's display window.



Presetting all receivable channels automatically

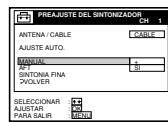
1 Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.



When using the EASY SET UP procedure, skip steps 1 and 2.



2 Press **↑/↓** to highlight PREAJUSTE DEL SINTONIZADOR, then press OK.



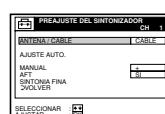
3 Press **↑/↓** to highlight ANTENA/CABLE, then press OK.



- To preset cable TV channels: Press **↑/↓** to set ANTENA/CABLE to CABLE, then press OK.



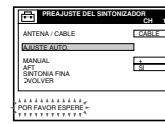
- To preset VHF and UHF channels: Press **↑/↓** to set ANTENA/CABLE to ANT, then press OK.



4 Press **↑/↓** to highlight AJUSTE AUTO., then press OK.



- All receivable channels are preset in numerical sequence. When no more receivable channels can be found, presetting stops and the picture from the lowest numbered channel is displayed on the TV screen.



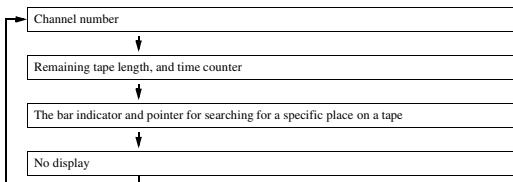
continued

Presetting channels | 25

26 | Presetting channels

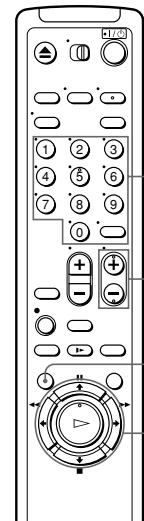
Tips

- When receiving a VHF, UHF, or CATV channel, the display changes as follows each time you press DISPLAY.



- If you want to return to the previous menu, highlight VOLVER and press OK.

Presetting/disabling channels manually



1 Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.

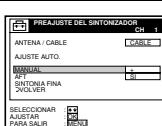


continued

Presetting channels | 27

28 | Presetting channels

2 Press **↑/↓** to highlight PREAJUSTE DEL SINTONIZADOR, then press OK.

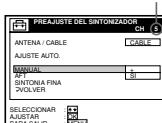


3  To preset a channel:
1 Press the number buttons to enter the channel number, then press ENTER.
2 Press OK.
3 Press **↑/↓** to set MANUAL to +, then press OK.

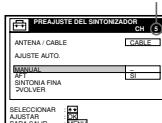


To disable a channel:
1 Press CH +/- to select the channel number.
2 Press OK.
3 Press **↑/↓** to set MANUAL to -, then press OK.

Channel to be preset



Channel to be disabled



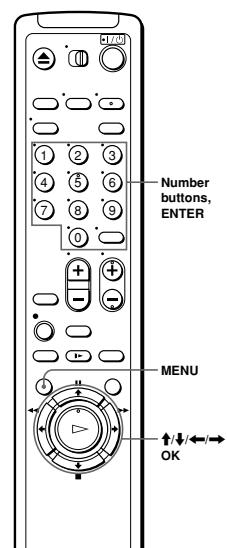
4  Repeat step 3 to preset or disable channels as required, then press MENU.

Tip

- If you want to return to the previous menu, highlight VOLVER and press OK.

If the picture is not clear

Normally, the Auto Fine Tuning (AFT) function automatically tunes in channels clearly. If, however, the picture of a channel is not clear, you can also use the manual tuning function.



1  Press MENU, then press **↑/↓** to highlight AJUSTES and press OK.

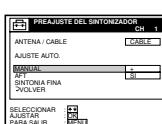


continued

Presetting channels | 29

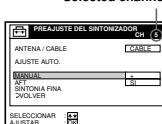
30 | Presetting channels

2 Press **↑/↓** to highlight PREAJUSTE DEL SINTONIZADOR, then press OK.



3  Press the number buttons to select the channel you want to fine-tune, then press ENTER.

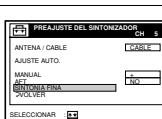
Selected channel



4  Press **↑/↓** to highlight SINTONIA FINA, then press OK.
The fine tuning meter appears.



5  Press **←/→** to adjust to a clearer picture, then press OK.
Note that the AFT setting switches to NO.



6  Press MENU to exit the menu.

Tips

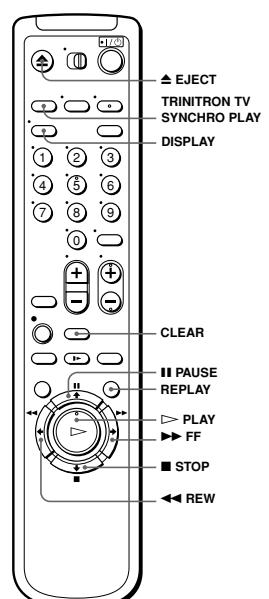
- To select the channel in step 3 above, you can also use the CH +/- buttons. In this case, you don't need to press ENTER.
- If you want to return to the previous menu, highlight VOLVER and press OK.

Note

- When adjusting SINTONIA FINA, the menu may become difficult to read due to interference from the picture being received.

Basic Operations

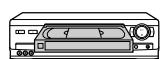
Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.

The VCR turns on and starts playing automatically if you insert a tape with its safety tab removed.



Presetting channels | 31

32 | Playing a tape



3 Press ▷ PLAY.
When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	■ PAUSE
Resume play after pause	■ PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF during stop
Rewind the tape	◀◀ REW during stop
Eject the tape	△ EJECT

To play a recently watched scene

You can immediately rewind and playback the scene you want to watch again. During playback, press REPLAY up to four times. The VCR rewinds the tape about ten seconds on the counter for each press of the button, and restarts playback.

To use the time counter

Press CLEAR at the point on the tape that you want to find later. The counter in the display window resets to "0:00:00." Search for the point afterwards by referring to the counter.



To display the counter on the TV screen, press DISPLAY.

Notes

- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- While displaying a menu on the TV screen, you cannot use ▷ PLAY, ■ PAUSE, ▶▶ FF, ▶◀ REW, or ■ STOP buttons.
- The counter resets to "0:00:00" whenever a tape is reinserted.
- The counter stops counting when it comes to a portion with no recording.

Turning on the VCR and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the VCR and TV with the audio/video cable (see "Audio/video (A/V) hookup" on pages 8 and 9). Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the VCR.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

The VCR and TV turn on, and the TV is set to the video channel. If there is a tape in the VCR, playback starts automatically.

Notes

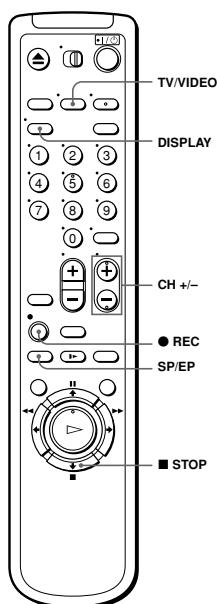
- If the Trinitron TV Synchro Play function does not work properly:
 - Wait a few moments, and press the button again.
 - Replace both of the batteries with new ones, and press the button again.
- Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY during playback. If you do so, the TV's input source will momentarily switch to the TV's tuner.

continued

Playing a tape | 33

34 | Playing a tape

Recording TV programs

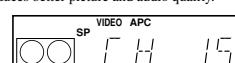


3 •CH Press CH +/- to select the channel or line input video source you want to record.



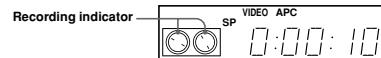
4 SP / EP Press SP/EP to select the tape speed, SP or EP.

EP (Extended Play) provides recording time three times as long as SP (Standard Play). However, SP produces better picture and audio quality.



5 ● REC Press ● REC to start recording.

The recording indicator lights up red in the display window.

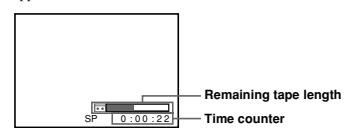


To stop recording

Press ■ STOP.

To check the remaining tape length

Press DISPLAY repeatedly until the remaining tape length and the time counter appear on the TV screen.



To check the remaining tape length of a T-140 or T-180 tape, set SELC. DE CINTA in the OPCIONES menu to 180. (For details, see page 62.)

1 Turn on your TV and set it to the video channel.
To record from a cable box, turn it on.

2 Insert a tape with its safety tab in place.

continued

Recording TV programs | 35

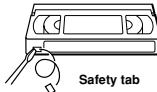
36 | Recording TV programs

To watch another TV program while recording

- 1 Press TV/VIDEO to turn off the VIDEO indicator in the display window.
- 2 If the TV is connected to the VCR's LINE OUT jacks, set the TV to the TV's antenna input; if not, skip this step.
- 3 Select another channel on the TV.

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on the tape again, cover the tab hole with adhesive tape.



Safety tab

Tips

- To select a channel, you can use the number buttons on the remote commander. Enter the channel number, then press ENTER.
- You can select a video source from the LINE-1 IN or LINE-2 IN jacks using the INPUT SELECT button.
- The display appears on the TV screen indicating information about the tape, but the information won't be recorded on the tape.
- If you don't want to watch TV while recording, you can turn off the TV. When using a cable box, make sure to leave it on.

Notes

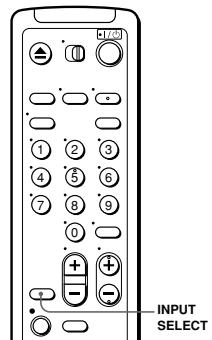
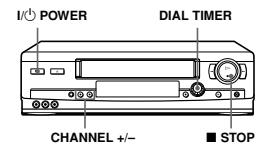
- The remaining tape length may not be indicated accurately for short tapes such as T-20 or T-30, or tapes recorded in the LP mode.
- The display does not appear during still (pause) mode or slow-motion playback.
- It may take up to one minute for the VCR to calculate and display the remaining tape length after you press DISPLAY.

Recording TV programs using the Dial Timer

The Dial Timer function allows you to make timer recordings of programs without turning on your TV. Set the recording timer to record up to eight programs that will be broadcast within a month using the DIAL TIMER. The recording start time and recording stop time can be set at one minute intervals.

Before you start...

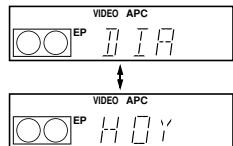
- When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



1 DIAL TIMER Press DIAL TIMER.



"DIA" and "HOY" appear alternately in the display window. If the date and time are not set, "DIA" flashes. See step 2 in the following section "To set the clock" to set the date and time.



38 Recording TV programs using the Dial Timer

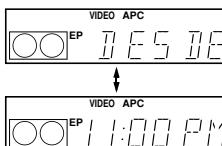
2 DIAL TIMER Turn DIAL TIMER to set the recording date.



3 DIAL TIMER Press DIAL TIMER.



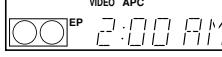
"DESDE" and the current time appear alternately in the display window.



4 DIAL TIMER Turn DIAL TIMER to set the recording start time.



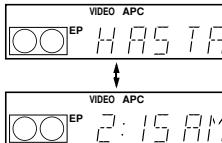
You can set the recording start time in 15 minute intervals or adjust the time in one minute intervals by pressing the CHANNEL +/- buttons.



5 DIAL TIMER Press DIAL TIMER.



"HASTA" and the recording stop time appear alternately in the display window.



6 DIAL TIMER Turn DIAL TIMER to set the recording stop time.



You can set the recording stop time in 15 minute intervals or adjust the time in one minute intervals by pressing the CHANNEL +/- buttons.



7 DIAL TIMER Press DIAL TIMER.



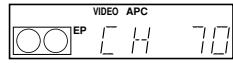
The channel number appears in the display window.



8 DIAL TIMER Turn DIAL TIMER to set the channel number.



To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, turn DIAL TIMER or press INPUT SELECT on the remote commander to display "L1" or "L2".



9 DIAL TIMER Press DIAL TIMER to complete the setting.



"OK" appears in the display window for about five seconds.

The  indicator appears in the display window and the VCR stands by for recording. When using a cable box, leave it on.

To return to the previous step

To return to the previous step, press the CHANNEL + and - buttons on the VCR at the same time during any of the Dial Timer settings.

To stop recording

To stop the VCR while recording, press ■ STOP.

continued

To use the VCR after setting the timer

To use the VCR before a timer recording begins, just press **I/**. The **⊕** indicator disappears from the display window and the VCR switches on. Remember to press **I/** to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter (page 33).
- Display tape information on the TV screen (page 36).
- Check the timer settings (page 50).
- Watch another TV program (page 37).

To set the clock

- 1 Turn DIAL TIMER so that "RELOJ" appears in the display window.
- 2 Press DIAL TIMER.
"DIA" appears in the display window.
- 3 Turn DIAL TIMER to set the day.
- 4 Press DIAL TIMER.
"MES" appears in the display window.
- 5 Turn and press DIAL TIMER to set the month and then the year.
After you set the year, "RELOJ" appears in the display window again.
- 6 Turn and press DIAL TIMER to set the hour and minute.
- 7 When you have finished setting the time, press DIAL TIMER to start the clock.

Tips

- To cancel a Dial Timer setting, press **■ STOP** on the VCR while you are making the setting.
- The program is recorded in the current tape speed. To change the tape speed, press **SP/EP** before you complete the setting in step 9 (page 40).
- When you are recording a program in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noise will appear on the picture when the tape speed is changed. If you want to keep the tape speed, set **VEL. AUTO. CINTA** to NO in the **OPCIONES** menu (page 62).
- To check, change, or cancel the program setting, see "Checking/changing/canceling timer settings" (page 50).

Notes

- If eight programs have already been set using the **PROG./VERIF.** menu, "LLENO" appears in the display window for about five seconds.
- If you set the clock using the Auto Clock Set function, the clock will adjust itself to the incoming time signal regardless of adjustments made with the Dial Timer. Be sure you have set ACS correctly.
- The **⊕** indicator flashes in the display window when you complete the setting in step 9 (page 40) with no tape inserted.

About the Demonstration Mode

The Dial Timer function has a Demonstration Mode that allows the user, such as a salesperson, to enter more than eight examples of timer settings when demonstrating the use of the Dial Timer. It cancels the LLENO notice which appears if eight programs have already been set. Do not use the Demonstration Mode for making timer recordings. Doing so may cause the settings to be inaccurate.

To activate the Demonstration Mode

Press **■ PAUSE** on the VCR while turning the DIAL TIMER. "DEMO" appears in the display window for a few seconds.

To cancel the Demonstration Mode

Turn the power off and unplug the AC power cord. Although the Demonstration Mode is canceled, the timer settings entered while using the Demonstration Mode will remain. Be sure to manually cancel the timer settings before you use the Dial Timer or any other timer method after reconnecting the AC power cord (see page 50).

continued

Recording TV programs using the Dial Timer | 41

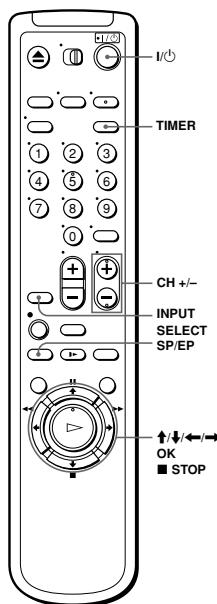
42 Recording TV programs using the Dial Timer

Recording TV programs using the timer

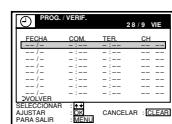
You can preset up to eight programs together with the Dial Timer settings at a time.

Before you start...

- Check that the VCR clock is set to the correct time.
- Turn on your TV and set it to the video channel. When using a cable box, turn it on.
- Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.



1 **TIMER** Press TIMER to display PROG./VERIF.



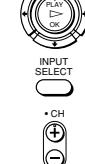
continued

Recording TV programs using the timer | 43

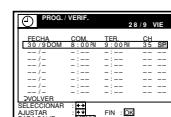
2 Press **↑/↓** to highlight the line that is to be set, then press **OK**.



3 Set the date, start and stop time, channel number, and tape speed:



- 1 Press **↑/↓** to set each item.
- 2 Press **→** to highlight and set each item in turn.



To correct a setting, press **←** to return to that setting and reset.
To record the same program every day or the same day every week, press **↓** while the date is highlighted. For details, see "Daily/weekly recording" below.

To record from a source connected to the LINE-1 IN or LINE-2 IN jacks, press **INPUT SELECT** or **CH +/-** to display "L1" or "L2" in the "CH" position.

4 Press OK to confirm the setting.
To enter another setting, press **↑/↓** to highlight the next line and repeat step 3.



5 **TIMER** Press TIMER.



6 Press **I/** to turn off the VCR.
The **⊕** indicator appears in the display window and the VCR stands by for recording.
When using a cable box, leave it on.

To stop recording

To stop the VCR while recording, press **■ STOP**.

Daily/weekly recording

In step 3 above, press **↓** to select the recording pattern. Each time you press **↓**, the indication changes as shown below. Press **↑** to change the indication in reverse order.

the current date → DOM-SAB → LUN-SAB → LUN-VIE → CADA SAB → → CADA LUN → CADA DOM → 1 month later → (dates count down) → the current date

44 Recording TV programs using the timer

To use the VCR after setting the timer

To use the VCR before timer recording begins, just press **I/O**. The **o** indicator disappears from the display window and the VCR switches on. Remember to press **I/O** to reset the VCR to the timer recording standby mode after using the VCR.

You can also do the following tasks while the VCR is recording:

- Reset the counter (page 33).
- Display tape information on the TV screen (page 36).
- Check the timer settings (page 50).
- Watch another TV program (page 37).

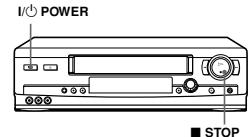
Tips

- To set the channel, you can also use the CH+/- or number buttons.
- To show the PROG/VERIF. menu, you can also use the MENU button. Press MENU, then press **▲▼** to highlight PROG/VERIF. and press **OK**.
- To set the tape speed, you can also use the SP/EP button.
- When you are recording a program in the SP mode and the remaining tape becomes shorter than the recording time, the tape speed is automatically changed to the EP mode. Note that some noise will appear on the picture when the tape speed is changed. If you want to keep the tape speed, set VEL. AUTO, CINTA to NO in the OPCIONES menu (page 62).
- To check, change or cancel the program setting, see "Checking/changing/canceling timer settings" (page 50).
- If you want to return to the previous menu and continue with other operations after setting the timer, press **↓** to highlight VOLVER, then press **OK**. The display returns to the MENU screen.

If you are finished using the VCR, turn off the power before timer recording starts.

Locking the VCR (Child Lock)

After you have set the timer, you can lock all of the buttons on the VCR so that the settings are not canceled by mistake.



To lock the VCR

When the VCR is turned on, hold down **I/O** POWER on the VCR until the **o** indicator appears in the display window. The VCR turns off and the **o** indicator remains lit. The VCR will not work except for timer recordings.

To unlock the VCR

Hold down **I/O** POWER on the VCR until the **o** indicator disappears from the display window. The VCR is unlocked and turns on.

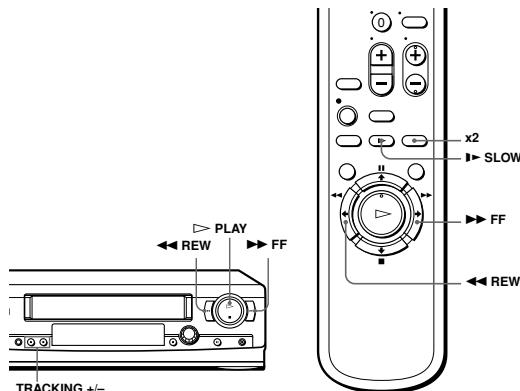
To stop timer recording while the VCR is locked, press **■ STOP**. The recording stops and the VCR is unlocked.

Note

- The VCR will be unlocked when:
 - You stop timer recording by pressing **■ STOP**.
 - You insert a tape.
 - The AC power cord is disconnected or power supply stops.

Additional Operations

Playing/searching at various speeds



Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold down ►► FF . During rewind, hold down ◀◀ REW .
Play at high speed	<ul style="list-style-type: none"> • During playback, briefly press ►► FF or ◀◀ REW on the remote commander. The tape continues to play at high speed. • During playback, hold down ►► FF or ◀◀ REW. When you release the button, normal playback resumes.
Play at twice the normal speed	During playback, press x2 .
Play in slow motion	During playback or pause, press ►► SLOW .
Play frame by frame	During pause, press ►► FF or ◀◀ REW on the remote commander. Hold down the button to play one frame each second.
Rewind and start play	While the tape is stopped, hold down ◀◀ REW on the VCR and press ►► PLAY on the VCR.

To resume normal playback

Press **►► PLAY**.

Tip

- Adjust the picture using the TRACKING +/- buttons if:
 - Streaks appear while playing in slow motion.
 - The picture shakes during pause.

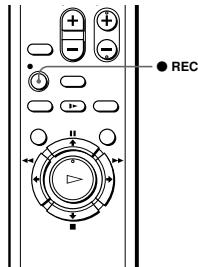
To set tracking to the center position, press both buttons (+/-) at the same time.

Notes

- The sound is muted during these operations.
- Tapes recorded in the LP mode on other VCRs can be played back on this VCR but the picture quality cannot be guaranteed.
- The picture may show noise when playing at high speed in reverse.

Setting the recording duration time

After you have started recording, you can have the VCR stop recording automatically after a specified duration.



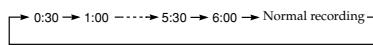
1 While recording, press ● REC.

The Ⓜ indicator appears in the display window.



2 Press ● REC repeatedly to set the duration time.

Each press advances the time in increments of 30 minutes.



The tape counter decreases minute by minute to 0:00, then the VCR stops recording and turns off automatically.

To extend the duration

Press ● REC repeatedly to set a new duration time.

To cancel the duration

Press ● REC repeatedly until the Ⓜ indicator disappears and the VCR returns to normal recording mode.

To stop while recording

Press ■ STOP.

Note

- You cannot display the current tape time in the display window when setting the recording duration time.

Setting the recording duration time | 49

3 Press ↑/↓ to highlight the setting you want to change or cancel.

- To change the setting, press OK and press ←/→ to highlight the item you want to change, then press ↑/↓ to reset it.
- To cancel the setting, press CLEAR.



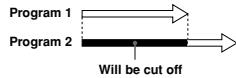
4 Press OK.

5 Press MENU to exit the menu.

If any timer settings remain, turn off the VCR to return to recording standby.

When the timer settings overlap

The program that starts first has priority and the second program starts recording only after the first program has finished. If the programs start at the same time, the program listed first in the menu has priority.



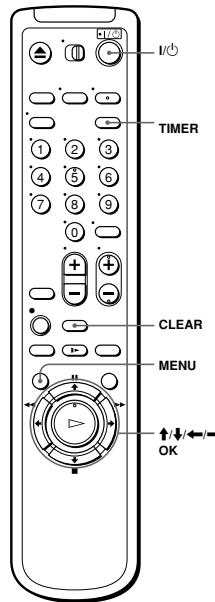
Tip

- To show the PROG./VERIF. menu, you can also use the MENU button. Press MENU, then press ↑/↓ to highlight PROG./VERIF. and press OK.

Checking/changing/canceling timer settings

Before you start...

- Turn on your TV and set it to the video channel.



1 Press I/O to turn on the VCR.

2 Press TIMER to display PROG./VERIF.

- If you want to change a setting, go on to the next step.
- If you do not need to change the settings, press MENU, then turn off the VCR to return to recording standby.

50 | Checking/changing/canceling timer settings

Recording stereo and bilingual programs (SLV-LX70S and LX60S only)

Recording stereo programs

This VCR automatically receives and records stereo programs. When a stereo program is received, the STEREO indicator lights up. If there is noise in the stereo program, set ESTEREO AUTO. in the OPCIONES menu to NO. The sound will be recorded in monaural (on both hi-fi and normal audio tracks) but with less noise. For details, see page 62.

Recording bilingual programs

Normally, this VCR records only the main sound. When a SAP (Second Audio Program) is received, the SAP indicator lights up. To record only SAP sound, set SINTONIZ. AUDIO in the OPCIONES menu to SAP. For details, see page 62.

Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want.

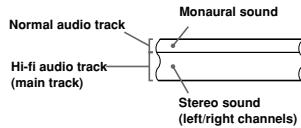
To listen to	On-screen display	Display window
Stereo	ESTEREO	STEREO
Left channel	L	STEREO
Right channel	R	STEREO
Monaural sound on the normal audio track	No indicator	No indicator

Checking/changing/canceling timer settings | 51

52 | Recording stereo and bilingual programs (SLV-LX70S and LX60S only)

How sound is recorded on a video tape

The VCR records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.

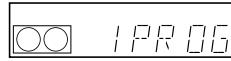


Notes

- To play a tape in stereo, you must use the A/V connections.
- When you play a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.

Searching for the beginning of a timer recorded program

If you record a program using the timer function, you can easily find the beginning of the recording with this SEARCH MODE function. The SEARCH MODE button lights up when the VCR finishes a timer recording and the display window shows the following:



Press DIAL TIMER.

The VCR turns on, rewinds to the beginning of the most recently recorded program and starts playback automatically. The SEARCH MODE button turns off.

Tip

- To turn off the SEARCH MODE button, first turn the VCR on, then press the SEARCH MODE button. (Do not press any other button at this point, otherwise this SEARCH MODE function will be canceled.) To start the SEARCH MODE function, press the SEARCH MODE button once. If you press the SEARCH MODE button repeatedly, you can enter the index search or Time Search mode (for details, see page 55 and 56).

Notes

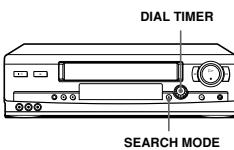
- This SEARCH MODE function will be canceled (the SEARCH MODE button turns off) if:
 - The VCR starts recording other programs.
 - You press ▶ PLAY, ▶▶ FF, ◀◀ REW, or ▴ EJECT button while the VCR is on.
 - If there is a power failure.

Recording stereo and bilingual programs (SLV-LX70S and LX60S only) | 53

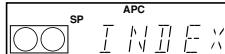
54 | Searching for the beginning of a timer recorded program

Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 9 index signals ahead of or behind the current position.

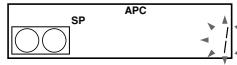


- 1 Press SEARCH MODE on the VCR repeatedly until "INDEX" appears in the display window (the SEARCH MODE button lights up).



- 2 Turn DIAL TIMER to specify how many index signals ahead or behind you want to search:

- To search ahead, turn DIAL TIMER clockwise.
- To search backwards, turn DIAL TIMER counterclockwise.



- 3 Press DIAL TIMER.

The VCR starts searching. The playback starts (the SEARCH MODE button turns off) from the point about five seconds ahead of the specified index mark.

To stop searching

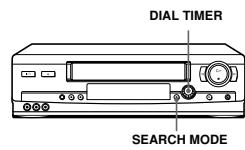
Press ■ STOP.

Note

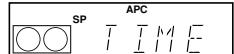
- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

Searching using the Time Search function

You can easily find a specific point on a tape by using the Time Search function. For example, you can find a recorded portion 15 minutes ahead of or behind the current position of a tape by using the Time Search function.



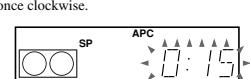
- 1 Press SEARCH MODE repeatedly until "TIME" appears in the display window (the SEARCH MODE button lights up).



- 2 Turn DIAL TIMER clockwise or counterclockwise to set the length of the time portion you want the VCR to fast-forward or rewind the tape. Each turn on the control increases or decreases the duration by 15 minutes.

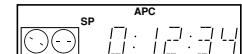
For example, if you want to watch a recorded portion 15 minutes ahead of the current position, turn DIAL TIMER once clockwise.

To change the time by one minute, press CHANNEL +/-.



- 3 Press DIAL TIMER.

The VCR starts searching and the tape counter starts counting until it reaches the specified point.



The VCR starts playback automatically when the tape counter reaches the specified point (the SEARCH MODE button turns off).

To stop searching

Press ■ STOP.

Tip

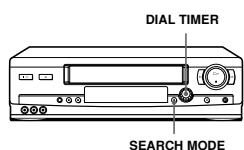
- The VCR can search up to six hours ahead of or behind the current position of a tape.

Searching using the index function | 55

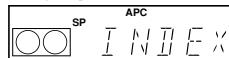
56 | Searching using the Time Search function

Searching using the index function

The VCR marks the tape with an index signal at the point where each recording begins. Use these signals as references to find a specific recording. The VCR can search up to 9 index signals ahead of or behind the current position.

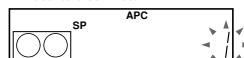


1 Press SEARCH MODE on the VCR repeatedly until "INDEX" appears in the display window (the SEARCH MODE button lights up).



2 Turn DIAL TIMER to specify how many index signals ahead or behind you want to search:

- To search ahead, turn DIAL TIMER clockwise.
- To search backwards, turn DIAL TIMER counterclockwise.



3 Press DIAL TIMER.

The VCR starts searching. The playback starts (the SEARCH MODE button turns off) from the point about five seconds ahead of the specified index mark.

To stop searching

Press ■ STOP.

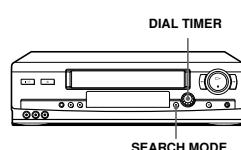
Note

- No index signal will be added when recording starts from recording pause. However, an index signal will be marked if you change the channel during recording pause.

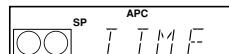
Searching using the index function | 55

Searching using the Time Search function

You can easily find a specific point on a tape by using the Time Search function. For example, you can find a recorded portion 15 minutes ahead of or behind the current position of a tape by using the Time Search function.



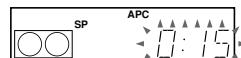
1 Press SEARCH MODE repeatedly until "TIME" appears in the display window (the SEARCH MODE button lights up).



2 Turn DIAL TIMER clockwise or counterclockwise to set the length of the time portion you want the VCR to fast-forward or rewind the tape. Each turn on the control increases or decreases the duration by 15 minutes.

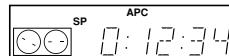
For example, if you want to watch a recorded portion 15 minutes ahead of the current position, turn DIAL TIMER once clockwise.

To change the time by one minute, press CHANNEL +/-.



3 Press DIAL TIMER.

The VCR starts searching and the tape counter starts counting until it reaches the specified point.



The VCR starts playback automatically when the tape counter reaches the specified point (the SEARCH MODE button turns off).

To stop searching

Press ■ STOP.

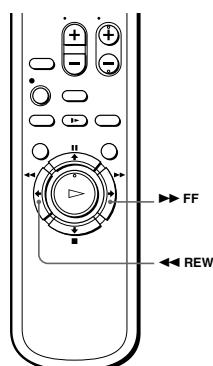
Tip

- The VCR can search up to six hours ahead of or behind the current position of a tape.

56 | Searching using the Time Search function

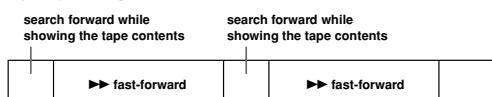
Skip-searching automatically (Quick View)

You can spot check an entire tape quickly using the Quick View function. At intervals, the VCR skips playback while searching forward or backward.



Hold down ►► FF (or ◀◀ REW) more than two seconds during stop. "SKIP" indicator appears on the TV screen.

The VCR searches forward (or backward) for about two minutes on the counter while showing the contents of the tape. Then it fast-forwards (or rewinds) for about ten minutes on the counter. The VCR repeats this operation until it stops at the end (or beginning) of the tape.



To cancel skip-search

Press ▷ PLAY or ■ STOP.

Note

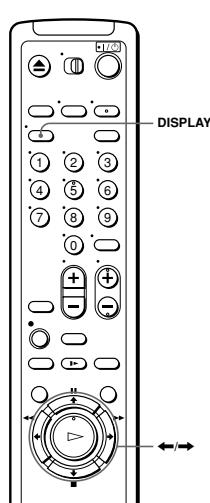
- The VCR automatically fast-forwards (or rewinds) any portion with no recording.

Skip-searching automatically (Quick View) | 57

Searching for a selected point on the tape

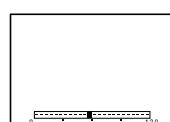
You can easily find a specific point by moving the pointer on the TV screen.

The VCR fast-forwards or rewinds to the point you indicate and starts playback automatically.



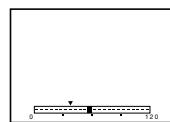
1 Press DISPLAY repeatedly until the bar indication appears on the TV screen.

A cursor (■) indicating the current position of the tape appears on the bar indication. If the cursor does not appear, play the tape a few moments (by pressing ▷ PLAY, ►► FF, or ◀◀ REW) until the cursor appears.



2 Press →/← to move the pointer (▼) to the point where you want to start playback.

The VCR starts searching and the cursor (■) moves toward the pointer. When the VCR locates the marked point, playback starts.



58 | Searching for a selected point on the tape

To cancel searching

Press **▷** PLAY or **■** STOP.

To turn off the bar indication

Press DISPLAY again.

Notes

- The figure on the bar indication represents the total time length of the inserted tape as shown below.
- The total time length may not be displayed correctly for:
 - Tapes other than T-60, T-120, or T-160.
 - Tapes recorded in more than one tape speed mode.

Tape type	Total time length		
	SP	LP	EP
T-60 or shorter	60	120	180
from T-80 to T-140	120	240	360
T-160 or longer	160	320	480

- If you move the pointer (▼) on the bar indication while searching, the VCR searches for the new reset point.
- With the bar indication on, the **▶▶ FF/◀◀** and **◀◀ REW/▶▶** buttons **on the remote commander** work only for moving the pointer (▼) and are not used for normal tape operation. The **▶▶ FF** and **◀◀ REW** buttons **on the VCR** are used for normal tape operation. Note, however, if you press these buttons **on the VCR**, searching is canceled.

Searching for a selected point on the tape | 59

About the Adaptive Picture Control (APC) function

The Adaptive Picture Control (APC) function automatically improves recording and playback quality by adjusting the VCR to the condition of the video heads and tape. To maintain better picture quality, we recommend that you set APC to SI on PÁGINA2 of the OPCIONES menu (the APC indicator lights up in the display window). For details, see page 63.

APC playback

The APC function automatically works on all types of tapes, including rental tapes and tapes that were not recorded with APC.

APC recording

Whenever you insert a tape and first start recording, the VCR adjusts to the tape using the APC function (the APC indicator flashes rapidly). This adjustment is retained until the tape is ejected.

Notes

- The auto tracking adjustment cannot be guaranteed to work with tapes recorded in the LP mode on other VCRs.
- The APC function does not work if the tape speed is automatically changed from the SP to EP mode during a timer recording when VEL. AUTO. CINTA is set to SI in the OPCIONES menu, unless the tape has been recorded in the EP mode with the APC function.
- There is a delay of about ten seconds before the VCR actually starts recording while the VCR analyzes the tape. To avoid the delay, first set the VCR to recording pause (the APC indicator flashes slowly) and press **REC** to have the VCR analyze the tape (the APC indicator flashes rapidly) and return to recording pause. After the APC indicator stops flashing, press **PAUSE** to start recording immediately.
- If you want to start recording quickly without using the APC function, first set the VCR to recording pause (the APC indicator flashes slowly) and press **PAUSE** again to start recording.

Adjusting the picture

Adjusting the tracking

Although the VCR automatically adjusts the tracking when playing a tape (the **■** indicator flashes in the display window, then turns off), distortion may occur if the recording is in poor condition. In this case, manually adjust the tracking.

Press **TRACKING ↑↓** to display the tracking meter. The distortion should disappear as you press one of the two tracking buttons (the **■** indicator lights up). To resume automatic tracking adjustment, eject the tape and reinsert it.



About the Reality Regenerator function

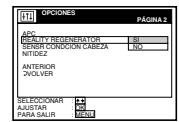
The Reality Regenerator function automatically restores the picture to its original quality during playback.

To use the Reality Regenerator function

1 Press MENU, then select OPCIONES and press OK.

2 Press **↑↓** to highlight PRÓXIMA, then press OK.

3 Press **↑↓** to highlight REALITY REGENERATOR on PÁGINA2 of the OPCIONES menu, then press OK.



4 Press **↑↓** to set REALITY REGENERATOR to SI, then press OK.

The RR indicator lights up in the display window.

5 Press MENU to return to the original screen.

To turn it off, select NO in step 4. The RR indicator turns off in the display window.

60 | Adjusting the picture

Changing menu options

1 Press MENU, then select OPCIONES and press OK.



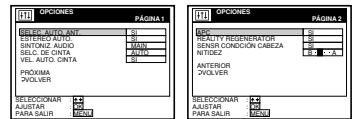
2 Press **↑↓** to highlight the option to change, then press OK.

To go to PÁGINA2, highlight PRÓXIMA and press OK. To return to PÁGINA1, highlight ANTERIOR and press OK.

3 Press **↑↓** to change the setting, then press OK.

To adjust the sharpness, press **◀▶** and press OK.

4 Press MENU to return to the original screen.



Menu choices

Initial settings are indicated in bold print.

PÁGINA1

Menu option	Set this option to
SELEC. AUTO. ANT.	<ul style="list-style-type: none"> SI if your TV is connected only to VHF/UHF OUT on the VCR. To play a tape, set the TV to the VCR channel (channel 3 or 4). NO if your TV is connected to both VHF/UHF OUT and LINE OUT on the VCR. To play a tape, set the TV to the VCR input.
ESTEREO AUTO. (SLV-LX70S and LX60S only)	<ul style="list-style-type: none"> SI to receive stereo programs. NO to reduce noise. The sound changes to monaural.
SINTONIZ. AUDIO (SLV-LX70S and LX60S only)	<ul style="list-style-type: none"> MAIN to record the main sound on both hi-fi and normal audio tracks. SAP to record the SAP (Second Audio Program) sound on both hi-fi and normal audio tracks.
SEL.C. DE CINTA	<ul style="list-style-type: none"> AUTO when using a T-160 length tape or any tape shorter than a T-140 length tape. 180 when using a T-140 or T-180 length tape. <p>For details, see page 36.</p>
VEL. AUTO. CINTA	<ul style="list-style-type: none"> SI to change the timer recording tape speed automatically to the EP mode when the remaining tape length becomes shorter than the recording time. To operate VEL. AUTO. CINTA, set SEL.C. DE CINTA correctly. NO to keep the same tape speed.

Adjusting the picture | 61

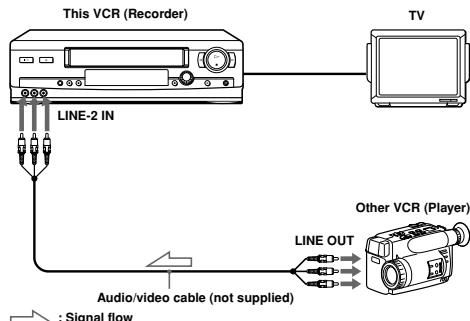
62 | Changing menu options

Menu option	Set this option to
APC	• SI to switch on the APC (Adaptive Picture Control) function and improve picture quality. • NO to switch off APC.
REALITY REGENERATOR	• SI to switch on the Reality Regenerator (Reality Regenerator) function and restore the picture to its original quality during playback. • NO to switch off Reality Regenerator.
SENSR CONDICIÓN CABEZA	• SI to allow the VCR to automatically check the condition of the video heads and inform you when they are dirty. • NO to turn off the sensor.
NITIDEZ	• B (Low) through A (High) to adjust the sharpness of the picture. Select B to turn off the sharpness control.

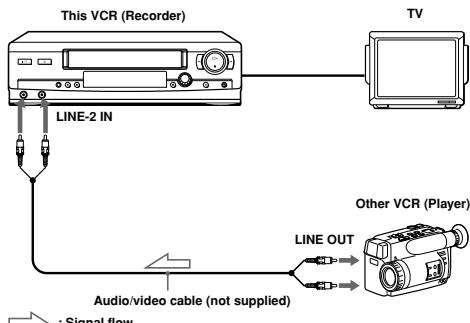
Editing with another VCR

How to connect to record on this VCR

SLV-LX70S and LX60S



SLV-LX50 and LX40



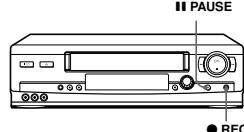
Notes

- Make sure you connect the plugs to jacks of the same color.
- If you connected this VCR to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- You can use the LINE-1 IN jacks for editing.
- If the other VCR is a monaural type and connected to this VCR's LINE-2 IN jacks, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. If you connect to the AUDIO R (red) jack, the sound is recorded only on the right channel. (SLV-LX70S and LX60S only)
- If the other VCR is a monaural type and connected to this VCR's LINE-1 IN jacks, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to the AUDIO R/L jacks using a VMC-910HG audio/video cable (not supplied). (SLV-LX70S and LX60S only)

Operation (when recording on this VCR)

Before you start editing

- Turn on your TV and set it to the video channel.
- Press INPUT SELECT or CHANNEL +/- to display "L2" (or "L1") in the display window.
- Press SP/EP to select the tape speed, SP or EP.



1 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.

2 Insert a tape into this (recording) VCR. Search for the point to start recording and press II PAUSE.

3 Press ● REC on this VCR to set it to recording pause.

4 To start editing, press the II PAUSE buttons on both VCRs at the same time.

To stop editing

Press the II STOP buttons on both VCRs.

Tip

- To cut out unwanted scenes while editing, press II PAUSE on this VCR when an unwanted scene begins. When it ends, press II PAUSE again to resume recording.

Note

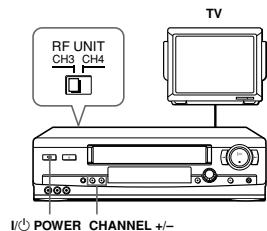
- If you start recording following the procedure above, the VCR won't start recording with the APC function. To record a tape with the APC function, press ● REC again during recording pause in step 3 so that the VCR analyzes the tape. Then, press II PAUSE after the APC indicator stops flashing to start recording. If you press II PAUSE before the APC indicator stops flashing, the APC function is canceled.

Additional Information

General setup information

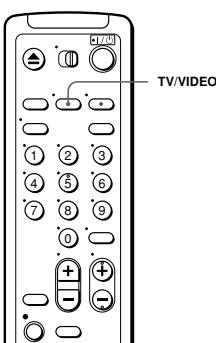
Setting the RF unit

When connecting the VCR to the TV using only the antenna cable, you must set the RF UNIT switch on the rear of the VCR so that the TV can receive the correct signal from the VCR.



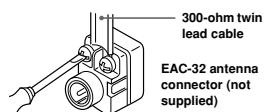
- 1 Set the RF UNIT switch on the rear of the VCR to CH3 or CH4, whichever channel is not used in your area. If both are used, set the switch to either channel.
- 2 Press I/O POWER to turn on the VCR.
- 3 Press TV/VIDEO to turn on the VIDEO indicator in the VCR's display window.
- 4 Press CHANNEL $+$ / $-$ to display a channel number in the display window. Select an active channel number in your area.
- 5 Turn on your TV and set it to the channel you selected in step 1 (channel 3 or 4). The channel you selected in step 4 appears on the TV screen. If the channels change when you press CHANNEL $+$ / $-$, you have made the correct setting.

Whenever you use the VCR, set the TV to the channel selected in step 1.



Attaching the external antenna connector

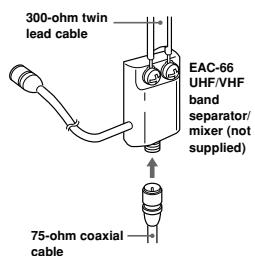
When using a 300-ohm twin lead cable for a VHF/UHF antenna, use the EAC-32 antenna connector (not supplied) to connect the antenna to the VCR.



- 1 Loosen the screws on the antenna connector.
- 2 Wind the twin leads around the screws on the antenna connector.
- 3 Retighten the screws.

Attaching a UHF/VHF band mixer

When using both a 75-ohm coaxial cable and a 300-ohm twin lead cable for a VHF/UHF antenna, use the EAC-66 UHF/VHF band separator/mixer (not supplied) to connect the antenna to the VCR.



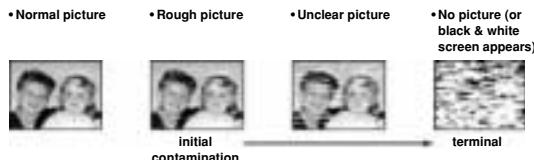
- 1 Loosen the screws on the mixer.
- 2 Wind the twin leads around the screws on the mixer.
- 3 Retighten the screws.
- 4 Connect the 75-ohm coaxial cable to the mixer.

continued

General setup information | 67

68 | General setup information

Symptoms caused by contaminated video heads



Head Condition Sensor

The Head Condition Sensor checks the video heads' condition. If the heads are dirty, a message will instruct you to insert a video head cleaning cassette.

Be sure to use the Sony T-25CLD or T-25CLDR video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service charge will be required).

Note

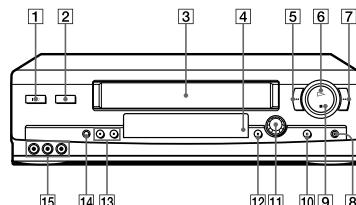
- SENSR CONDICIÓN CABEZA in OPCIONES must be set to SI for the Head Condition Sensor to operate.
- To turn off the head condition sensor message, set SENSR CONDICIÓN CABEZA to NO.

Index to parts and controls

Refer to the pages indicated in parentheses () for details.

Front panel

SLV-LX70S and LX60S



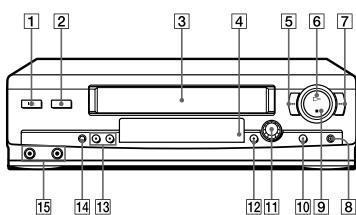
[1] I/O POWER switch (44)	[9] ■ STOP button (33) (66)
[2] Δ EJECT button (33)	[10] II PAUSE button (33) (66)
[3] Tape compartment	[11] DIAL TIMER (38) (54) (55) (56)
[4] Remote sensor (5)	[12] SEARCH MODE button (54) (55) (56)
[5] \blacktriangleleft REW (rewind) button (33) (47)	[13] CHANNEL/TRACKING $+$ / $-$ buttons (36) (60)
[6] \triangleright PLAY button (33) (47)	[14] EASY SET UP button (11) (13) (16)
[7] $\triangleright\triangleright$ FF (fast-forward) button (33) (47)	[15] LINE-2 IN VIDEO/AUDIO L/R jacks (64)
[8] ● REC (record) button (36) (49) (66)	

continued

Troubleshooting | 71

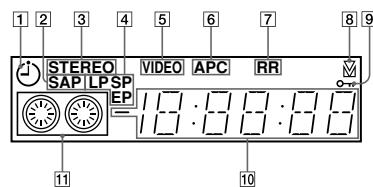
Index to parts and controls | 73

SLV-LX50 and LX40



- 1 I/POWER switch (44)
- 2 EJECT button (33)
- 3 Tape compartment
- 4 Remote sensor (5)
- 5 REW (rewind) button (33) (47)
- 6 PLAY button (33) (47)
- 7 FF (fast-forward) button (33) (47)
- 8 REC (record) button (36) (49) (66)
- 9 STOP button (33) (66)
- 10 PAUSE button (33) (66)
- 11 DIAL TIMER (38) (54) (55) (56)
- 12 SEARCH MODE button (54) (55) (56)
- 13 CHANNEL/TRACKING +/- buttons (36) (60)
- 14 EASY SET UP button (11) (13) (16)
- 15 LINE-2 IN VIDEO/AUDIO jacks (64)

Display window



- 1 Timer indicator (40) (44)
- 2 SAP (Second Audio Program) indicator (52) (SLV-LX70S and LX60S only)
- 3 STEREO indicator (52) (SLV-LX70S and LX60S only)
- 4 Tape speed indicator (36)
- 5 VIDEO indicator (37) (67)
- 6 APC (Adaptive Picture Control) indicator (61)
- 7 RR (Reality Regenerator) indicator (60)
- 8 Tracking indicator (60)
- 9 Child lock indicator (46)
- 10 Time counter/clock/line/channel indicator (33) (36) (66)
- 11 Tape/recording indicator (36)

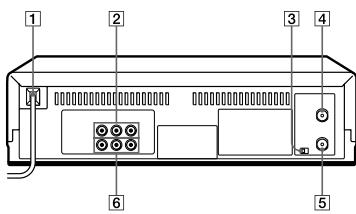
continued

74 | Index to parts and controls

Index to parts and controls | 75

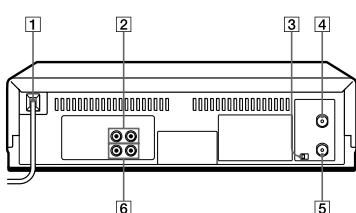
Rear panel

SLV-LX70S and LX60S



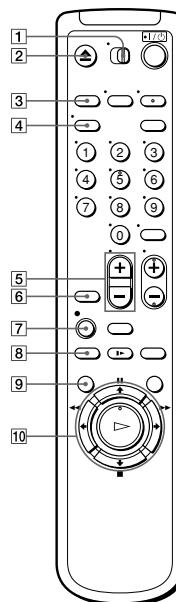
- 1 AC power cord (7)
- 2 LINE-1 IN AUDIO R/L/VIDEO jacks (65)
- 3 RF (Radio Frequency) UNIT switch (67)
- 4 VHF/UHF IN connector (10) (12) (15)
- 5 VHF/UHF OUT connector (10) (12) (15)
- 6 LINE OUT AUDIO R/L/VIDEO jacks (8)

SLV-LX50 and LX40



- 1 AC power cord (7)
- 2 LINE-1 IN AUDIO/VIDEO jacks (65)
- 3 RF (Radio Frequency) UNIT switch (67)
- 4 VHF/UHF IN connector (10) (12) (15)
- 5 VHF/UHF OUT connector (10) (12) (15)
- 6 LINE OUT AUDIO/VIDEO jacks (9)

Remote commander

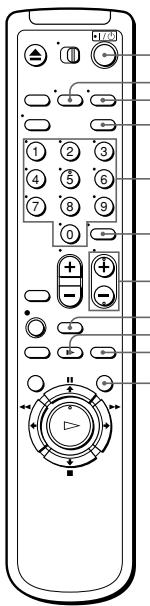


- 1 •TV / VIDEO switch (5)
- 2 EJECT button (33)
- 3 TRINITRON TV SYNCHRO PLAY button (34)
- 4 DISPLAY button (36) (58)
- 5 VOL (volume) +/- buttons (6)
- 6 INPUT SELECT button (37) (66)
- 7 REC (record) button (36) (49)
- 8 SP (Standard Play)/EP (Extended Play) button (36)
- 9 MENU button (18) (62)
- 10 PAUSE/ button (18) (33)
STOP/ button (18) (33)
REW (rewind)/ button (33) (47)
FF (fast-forward)/ button (33) (47)
PLAY/OK button (18) (33)

continued

76 | Index to parts and controls

Index to parts and controls | 77



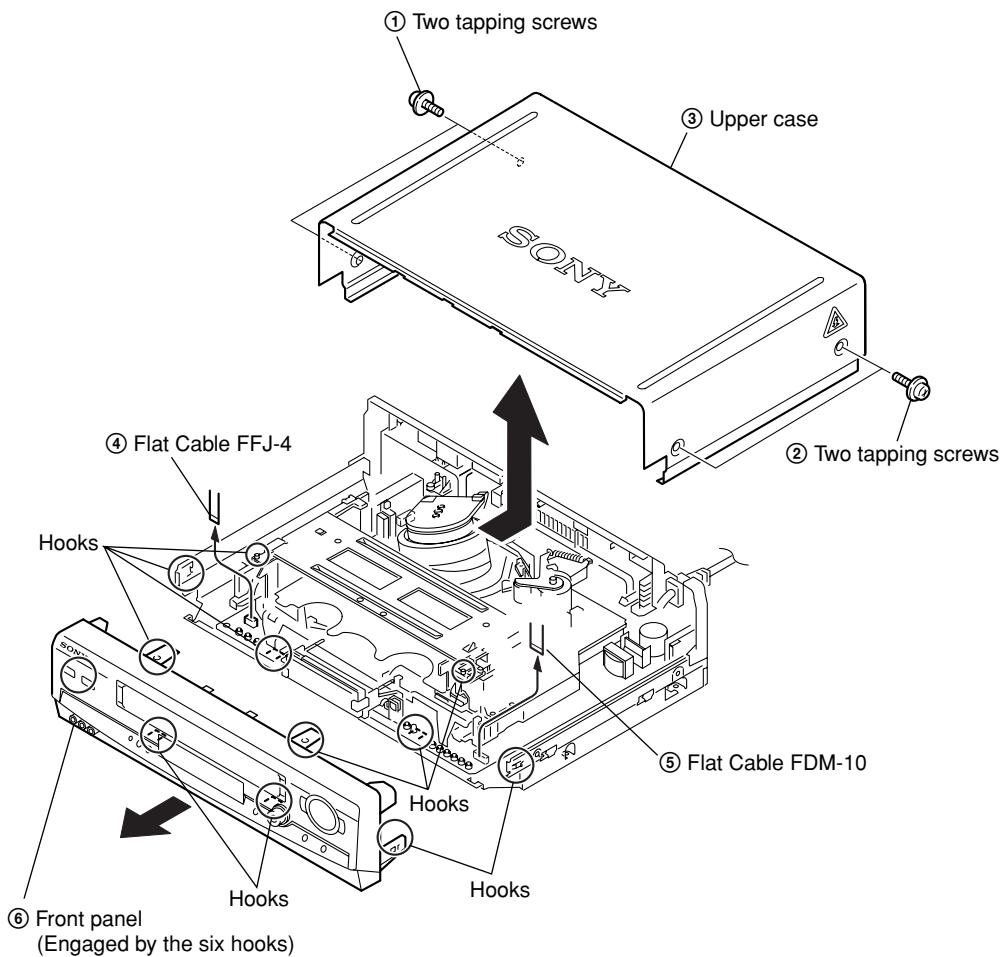
- [11] $\text{I} \text{U}$ (power) switch (6) (44)
- [12] TV/VIDEO button (6) (37)
- [13] AUDIO MONITOR button (52)
(SLV-LX70S and LX60S only)
- [14] TIMER button (43) (50)
- [15] Number buttons (31)
- [16] ENTER button (31)
- [17] CH (channel) $+$ / $-$ buttons (6) (36)
- [18] CLEAR button (33) (51)
- [19] ▶ SLOW button (47)
- [20] $\times 2$ button (47)
- [21] REPLAY button (33)

SECTION 2

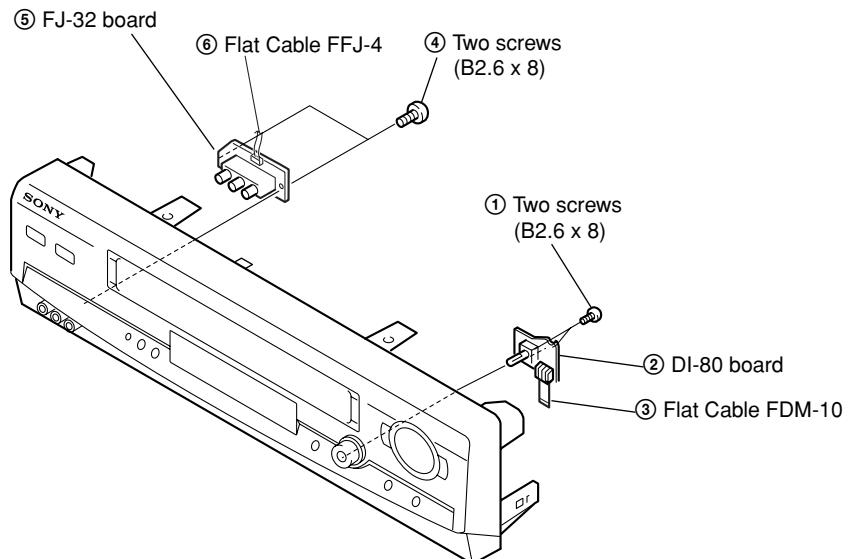
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

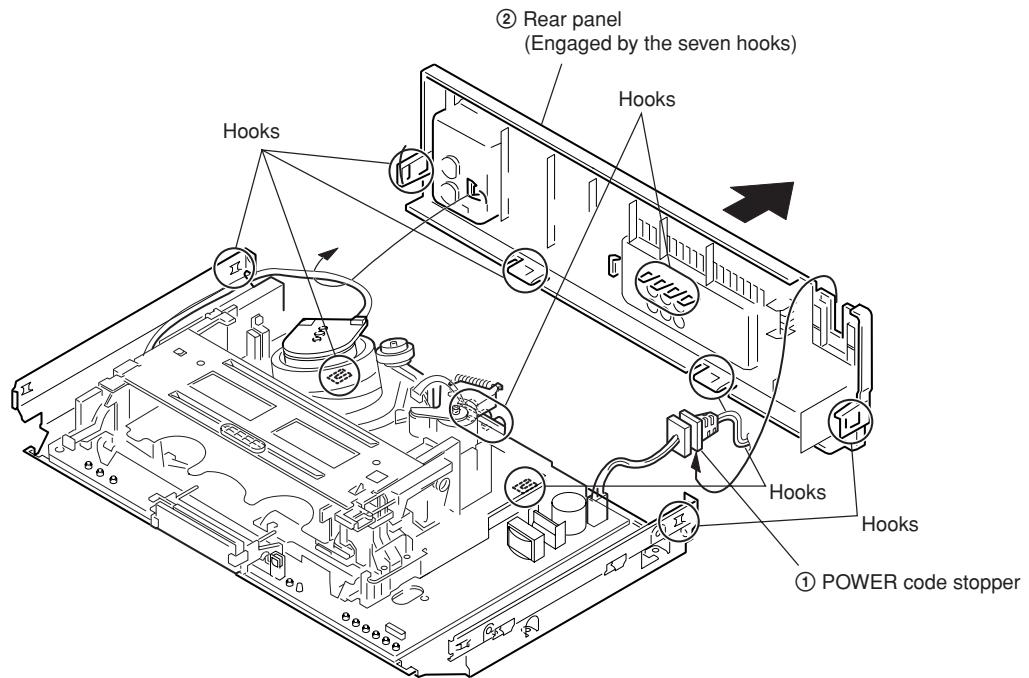
2-1. CASE, FRONT PANEL BLOCK ASSEMBLY



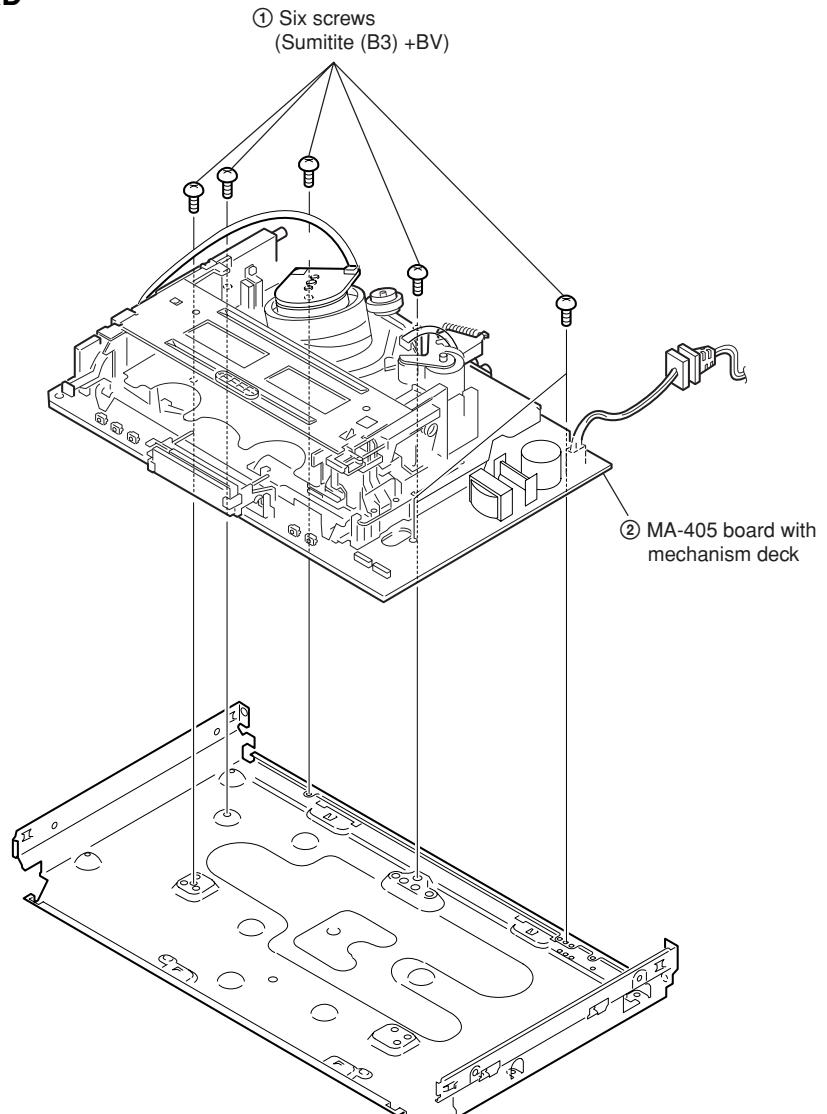
2-2. DI-80 BOARD, FJ-32 BOARD



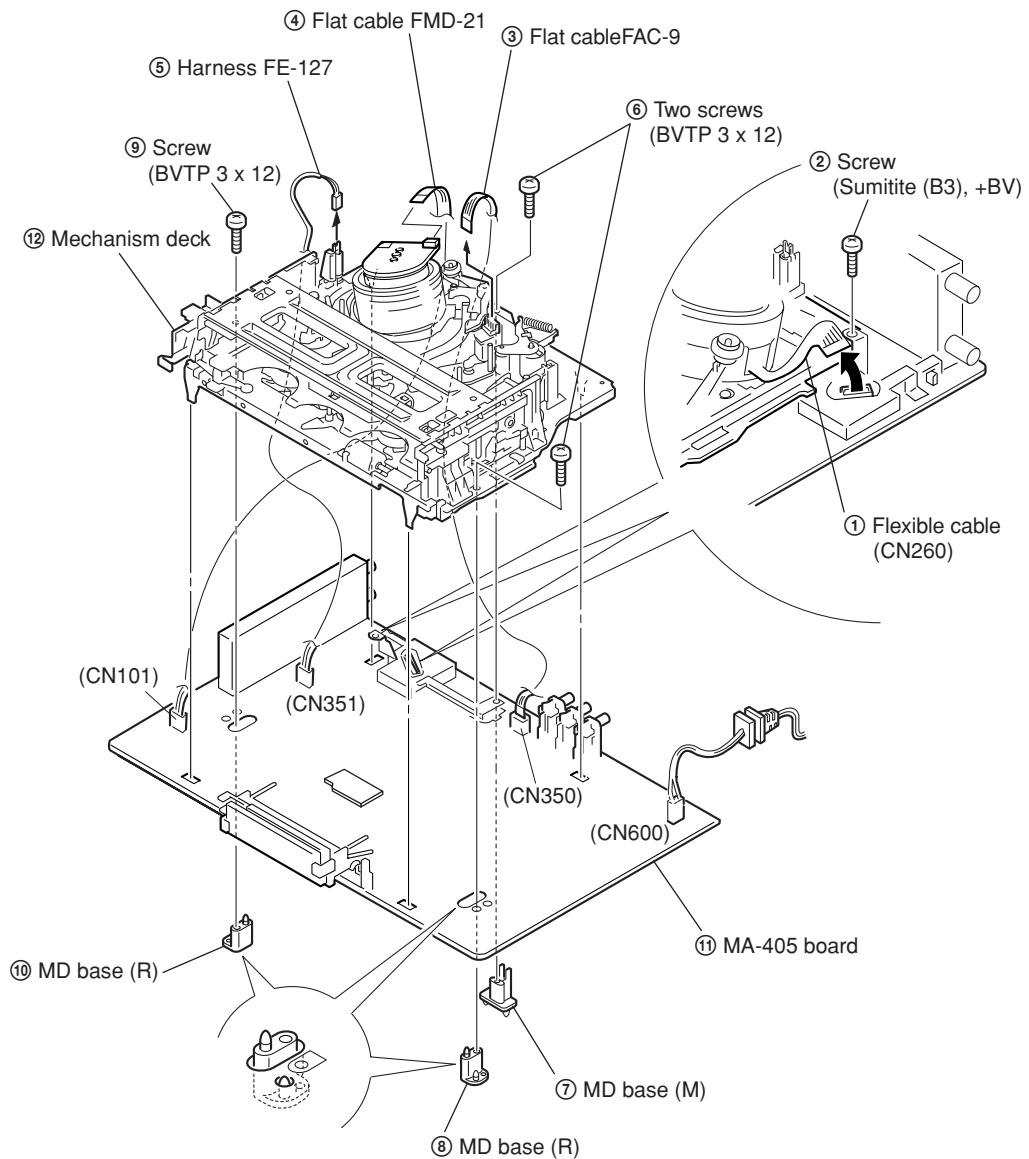
2-3. REAR PANEL



2-4. MA-405 BOARD

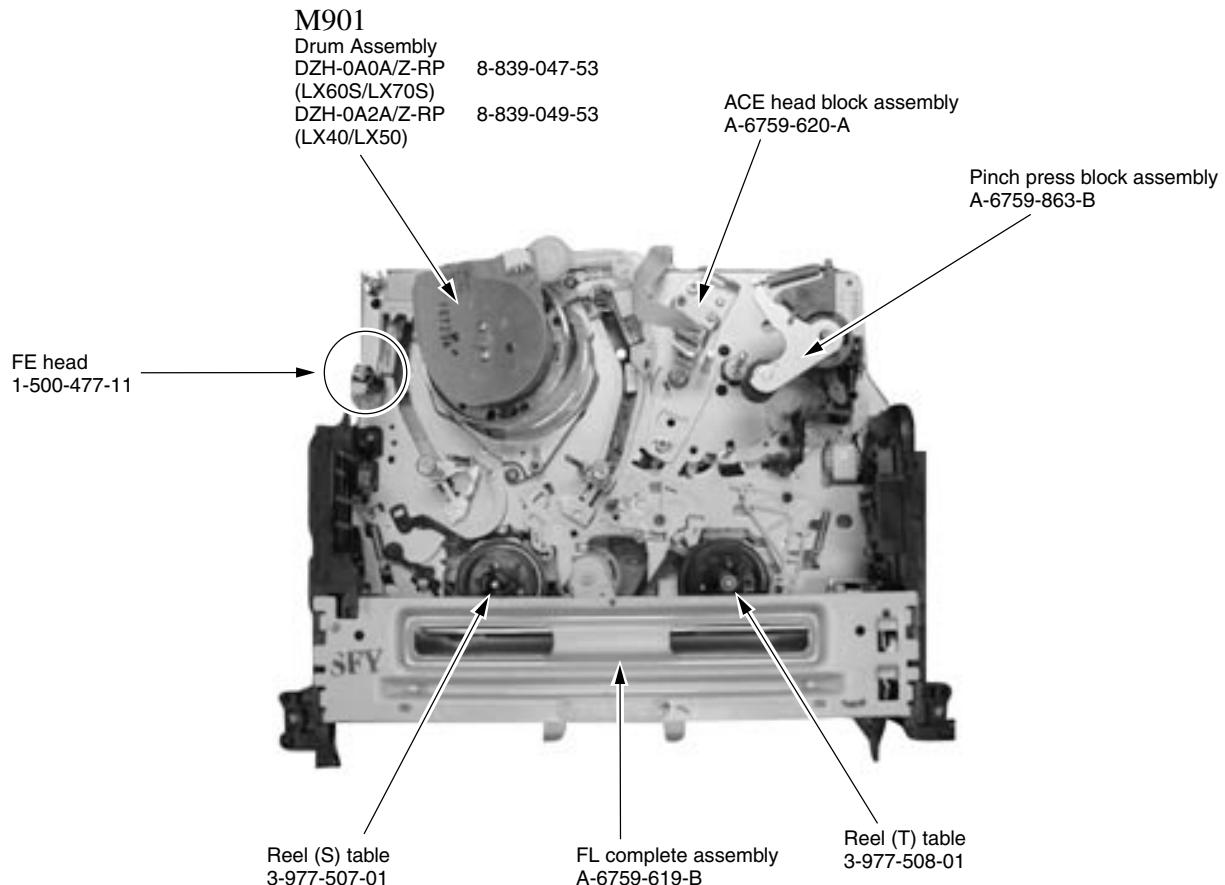


2-5. MECHANISM DECK

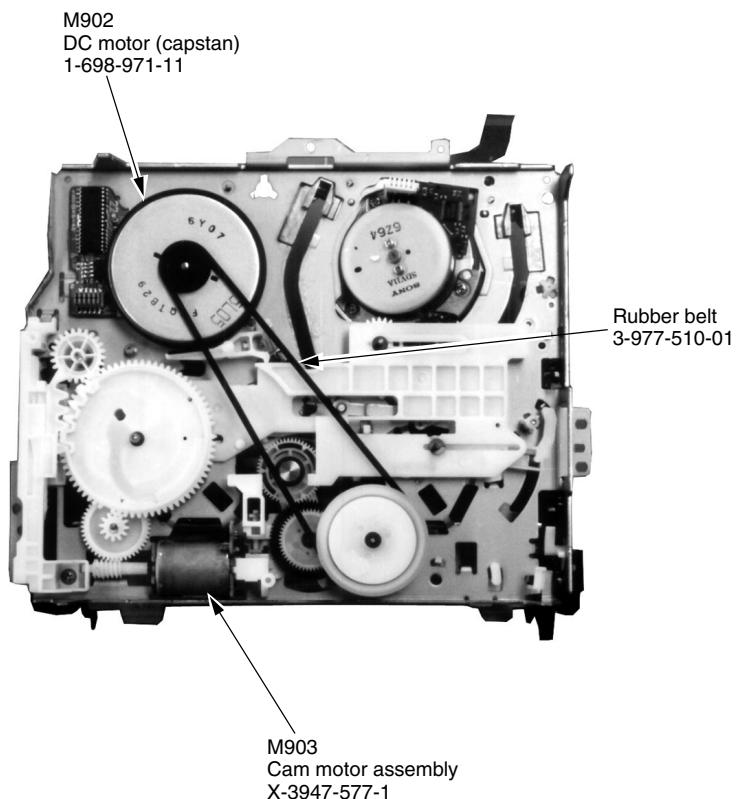


2-6. INTERNAL VIEWS

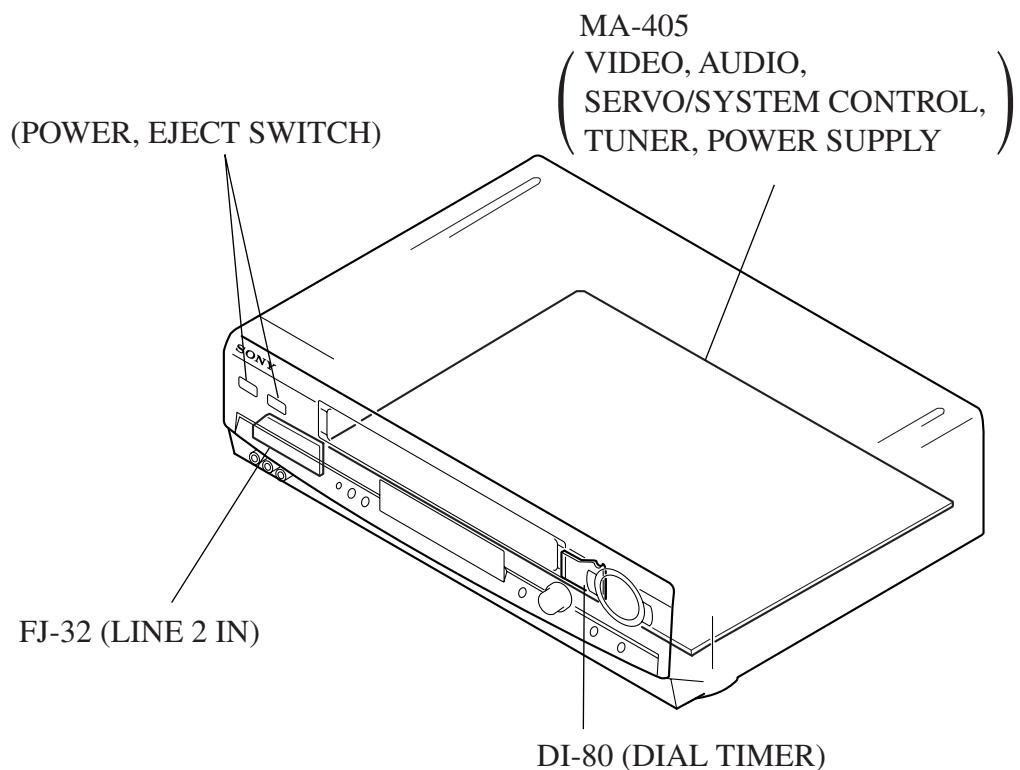
— Top View —



— Bottom View —



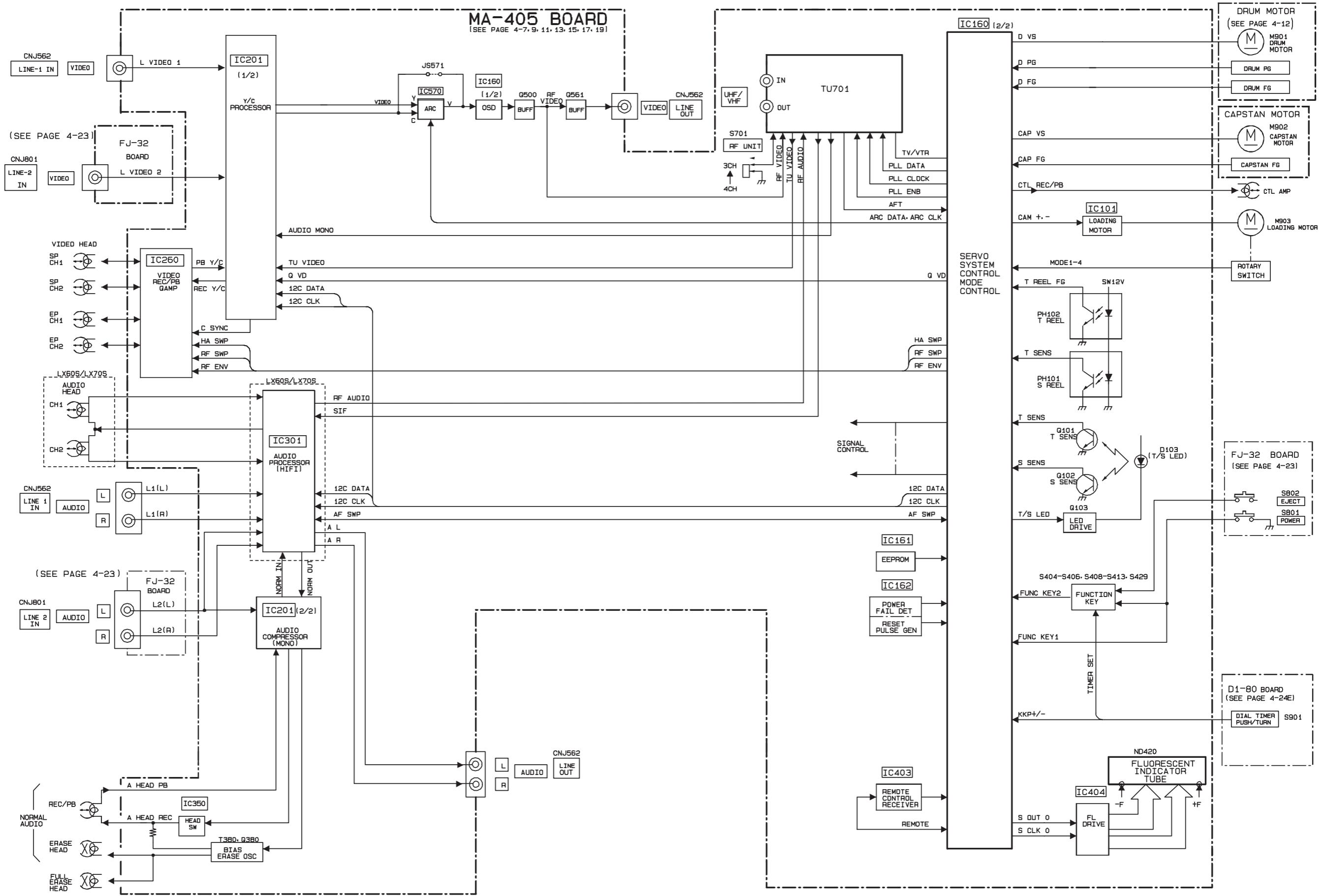
2-7. CIRCUIT BOARDS LOCATION



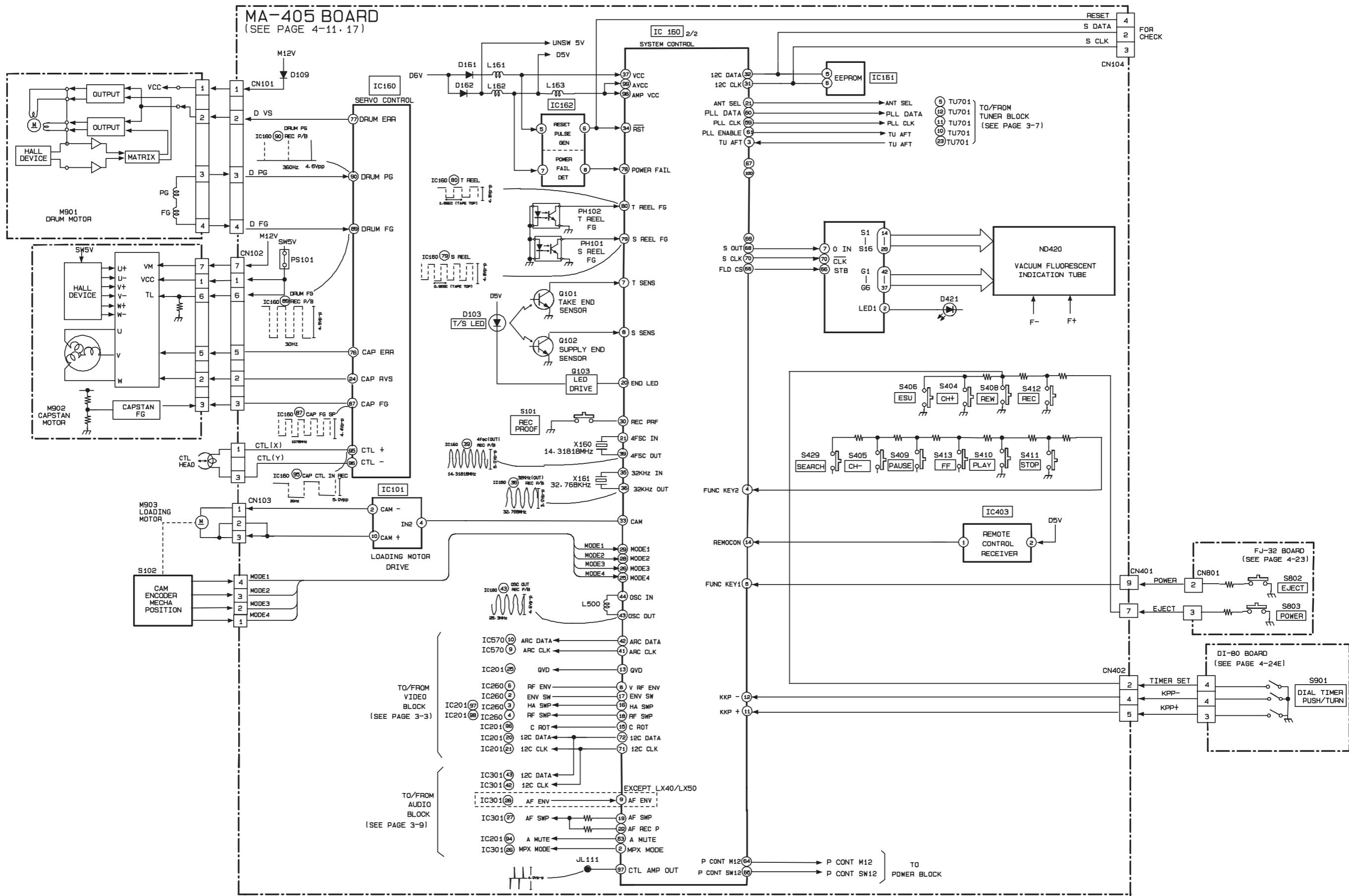
SECTION 3

BLOCK DIAGRAMS

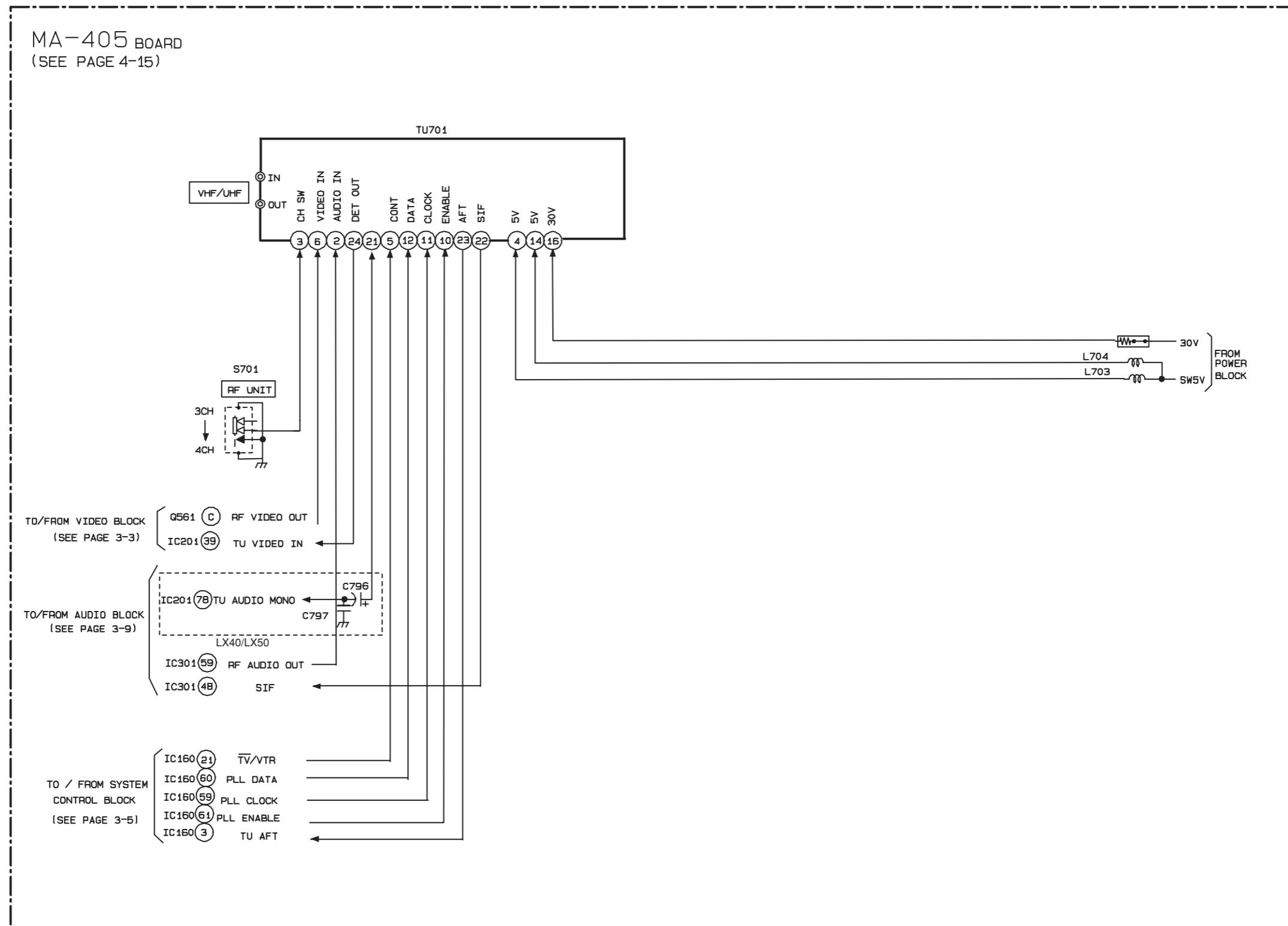
3-1. OVERALL BLOCK DIAGRAM



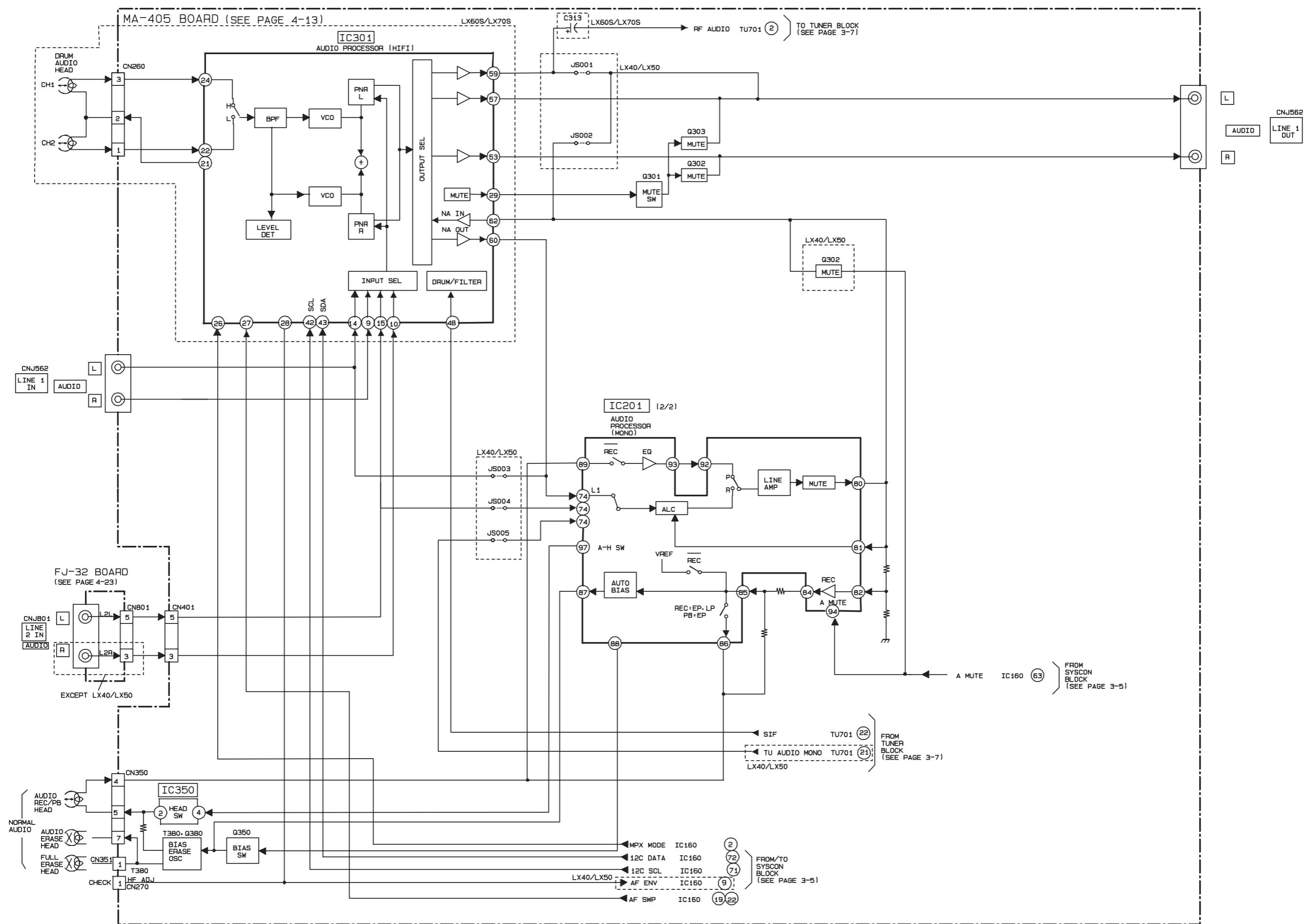
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



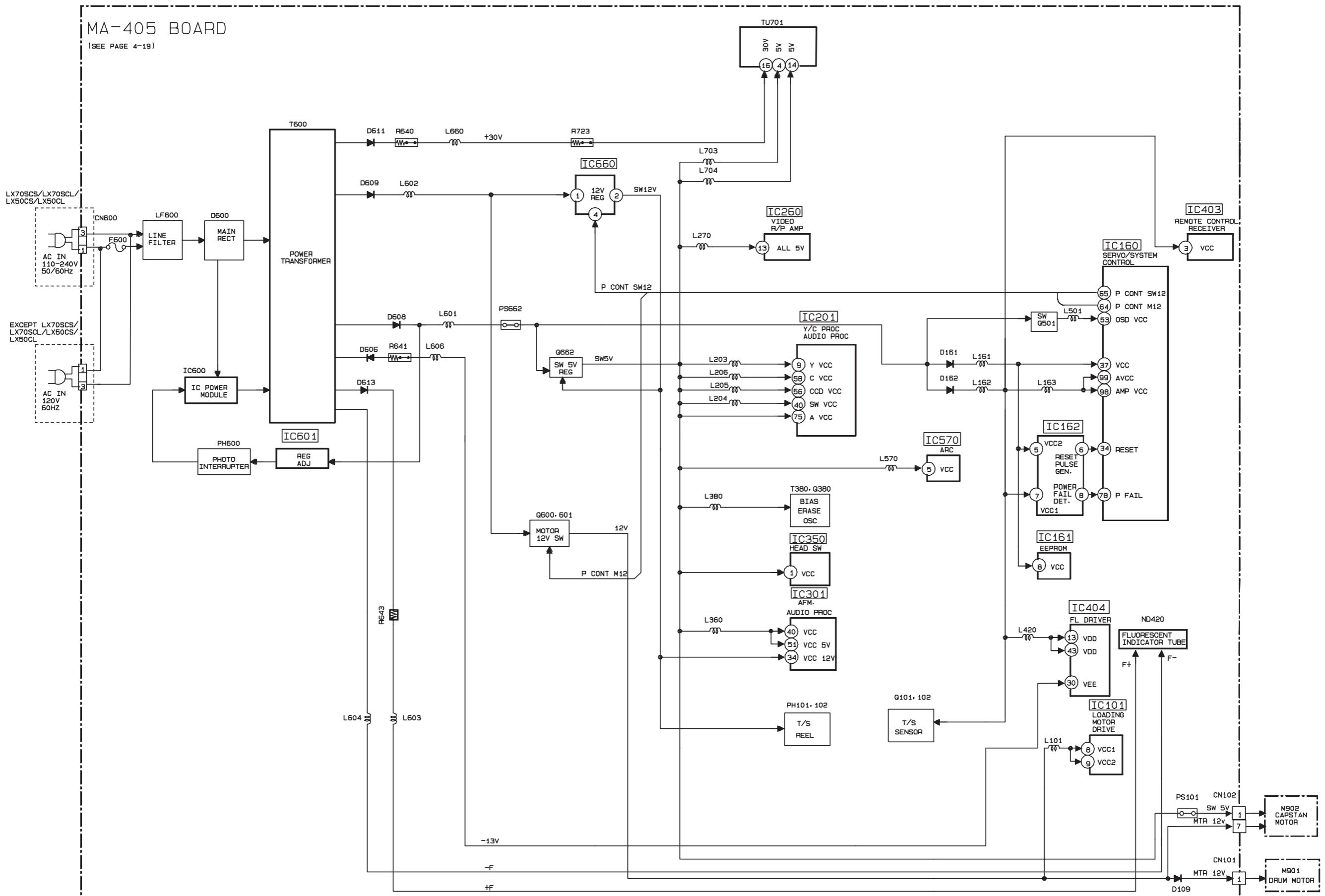
3-4. TUNER BLOCK DIAGRAM



3-5. AUDIO BLOCK DIAGRAM



3-6. POWER BLOCK DIAGRAM



SECTION 4

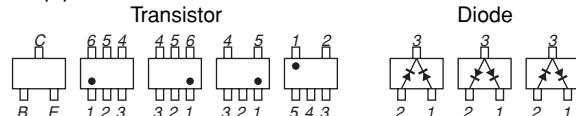
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this, the necessary note is printed in each block.)

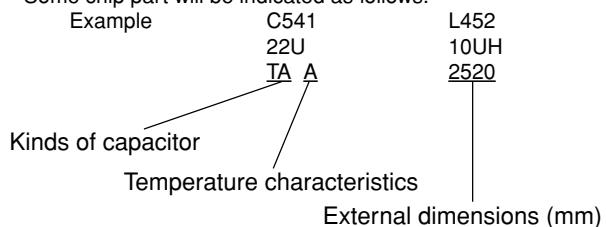
(For printed wiring boards)

-  : Pattern from the side which enables seeing.
(The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.



(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : $\mu\mu\text{F}$. 50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.
 $\text{k}\Omega=1000\Omega$, $\text{M}\Omega=1000\text{k}\Omega$.
- Caution when replacing chip parts.
New parts must be attached after removal of chip.
Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.



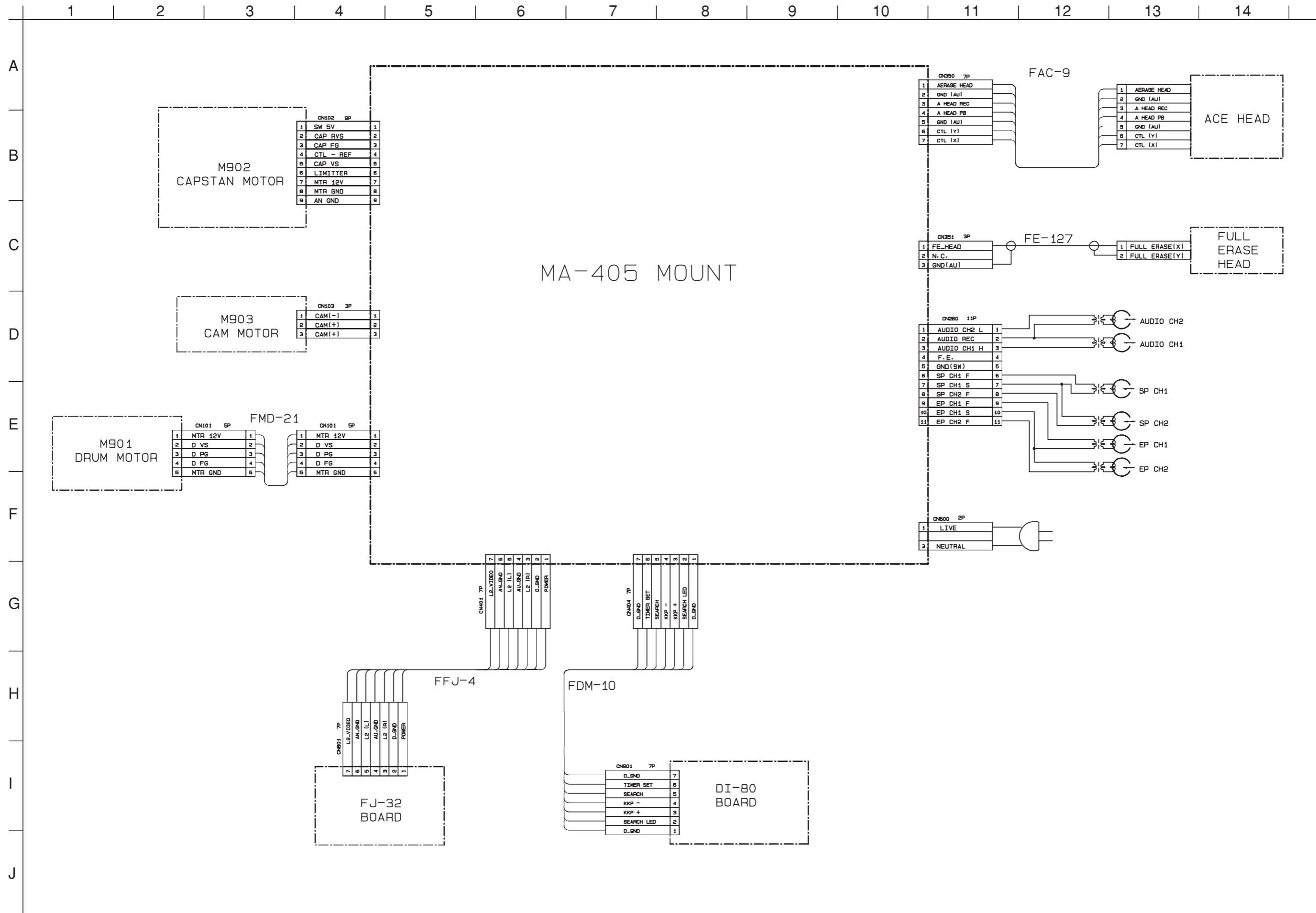
- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
In such cases, the unused circuits may be indicated.
- Parts with ★ differ according to the model/destination.
Refer to the mount table for each function.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
XEDIT → EDIT PB/XREC → PB/REC
-  : non flammable resistor
-  : fusible resistor
-  : panel designation
-  : internal component.
-  : B+ Line.
-  : B- Line.
- Circled numbers refer to waveforms.
- Readings are taken with a color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
-  : adjustment for repair.
- Circled numbers refer to waveforms.

When indicating parts by reference number, please include the board name.

Note :

The components identified by mark  or dotted line with mark  are critical for safety.
Replace only with part number specified.

4-1. FRAME SCHEMATIC DIAGRAM



MA-405 (VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER, POWER) PRINTED WIRING BOARD

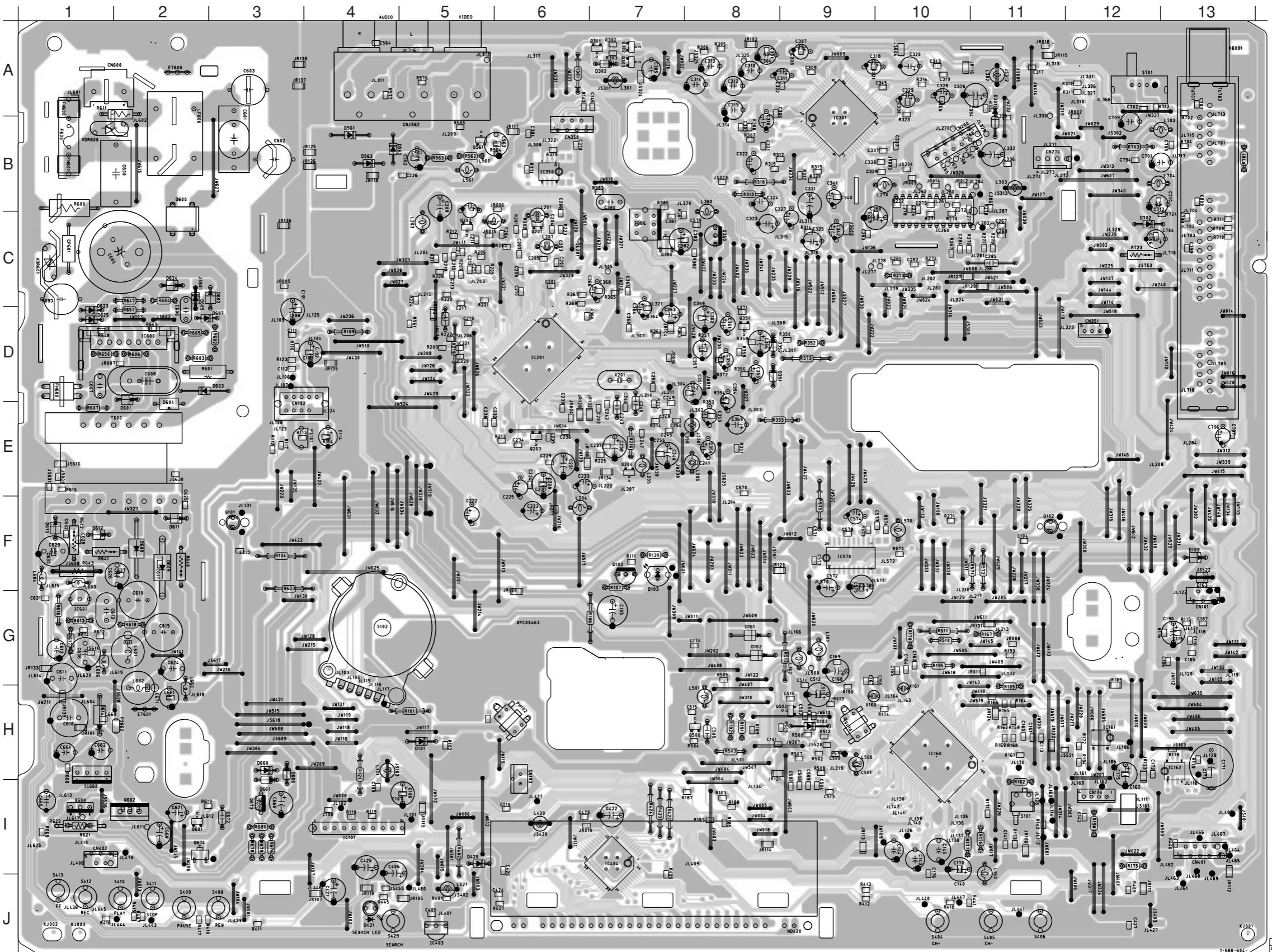
— Ref. No. MA-405 Board:1,000 Series —

There are few cases that the part printed on this diagram isn't mounted in this model.

MA-405 BOARD

D101	H5	IC260	C10
D102	H9	IC301	B9
D103	F7	IC350	B6
D161	G8	IC403	J5
D162	G8	IC404	I7
D163	F13	IC570	F9
D189	F13	IC600	D2
D301	A11	IC601	G1
D302	A7	IC660	I1
D351	D9		
D352	D9	Q101	F11
D420	I5	Q103	F7
D421	J4	Q181	F3
D561	B4	Q201	C6
D562	B4	Q202	C5
D563	B4	Q203	E6
D600	B2	Q204	E7
D601	E2	Q301	A7
D602	C3	Q302	A7
D603	D3	Q303	A7
D604	E2	Q350	C8
D605	C5	Q351	D8
D607	D3	Q380	C7
D608	F2	Q500	H8
D609	F2	Q600	I1
D611	F2	Q601	I2
D612	F1	Q662	I2
D613	F1	Q673	I3
D621	C2	Q674	I2
D623	C1		
D625	D1	CN101	G13
D660	H3	CN103	H6
D661	I3	CN104	I12
D666	H3	CN182	E3
D702	C12	CN260	B10
		CN270	B11
IC101	I4	CN351	D12
IC160	H10	CN358	B6
IC161	H12	CN402	I1
IC162	H13	CN600	A2
IC201	D6	CNJ562	B5

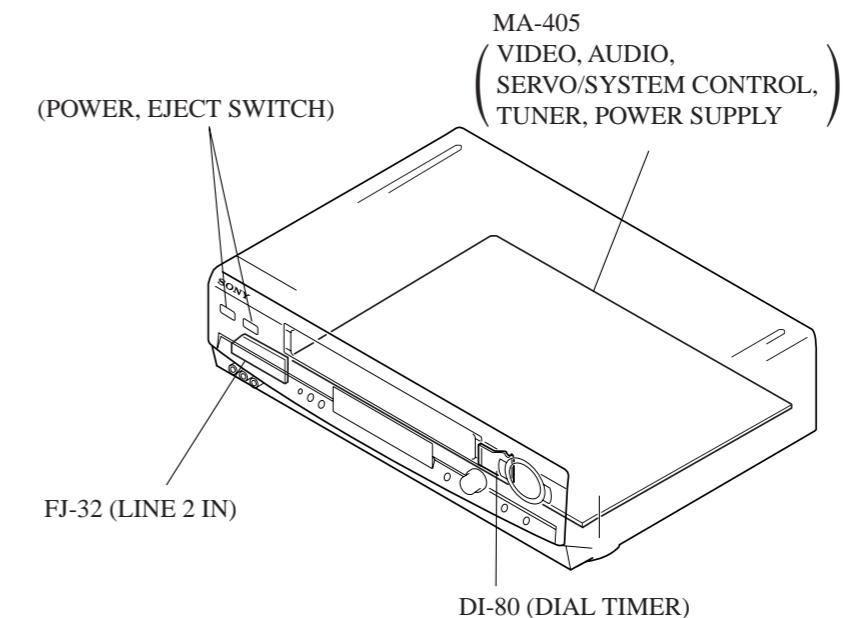
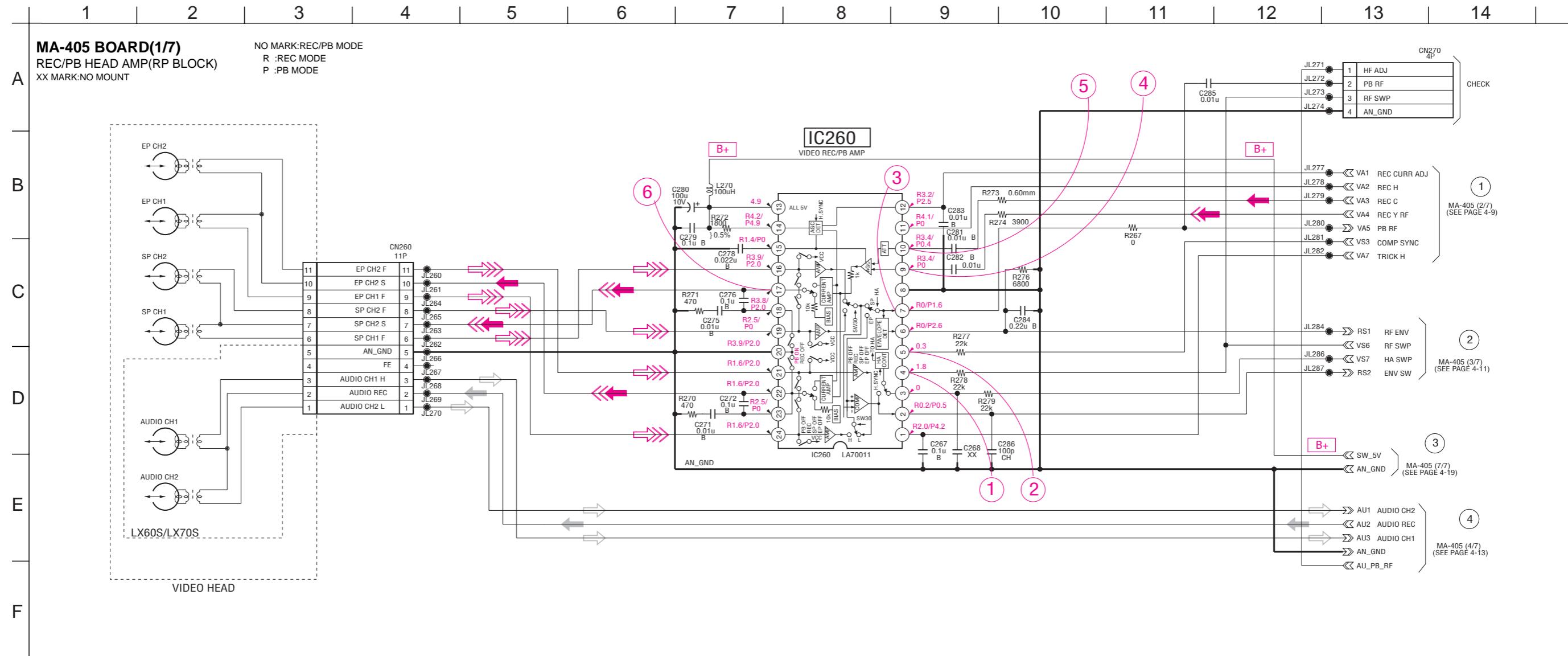
MA-405 BOARD (SIDE B)



MA-405 (REC/PB HEAD AMP) SCHEMATIC DIAGRAM

- Ref. No: MA-405 board; 1000 series -

• See page 4-21 for waveforms.



MA-405 (Y/C, AUDIO PROCESSOR) SCHEMATIC DIAGRAM

- Ref. No: MA-405 board; 1000 series -

• See page 4-5 for printed wiring board.

• See page 4-21 for waveforms.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

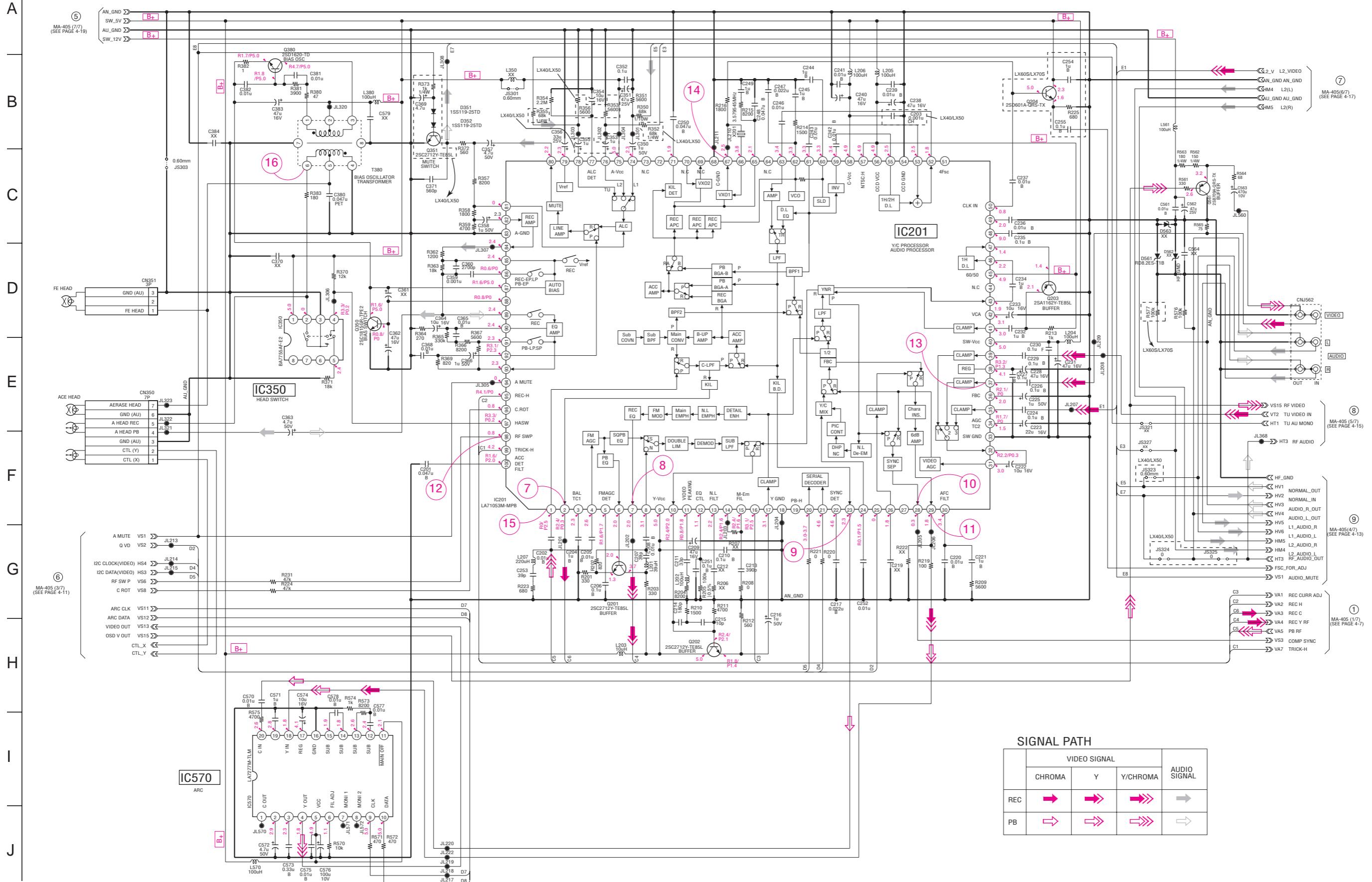
MA-405 BOARD(2/7)

Y/C, AUDIO PROCESSOR (VA BLOCK)

XX MARK: NO MOUNT
NO MARK: REC/PB MODE

R : REC MODE

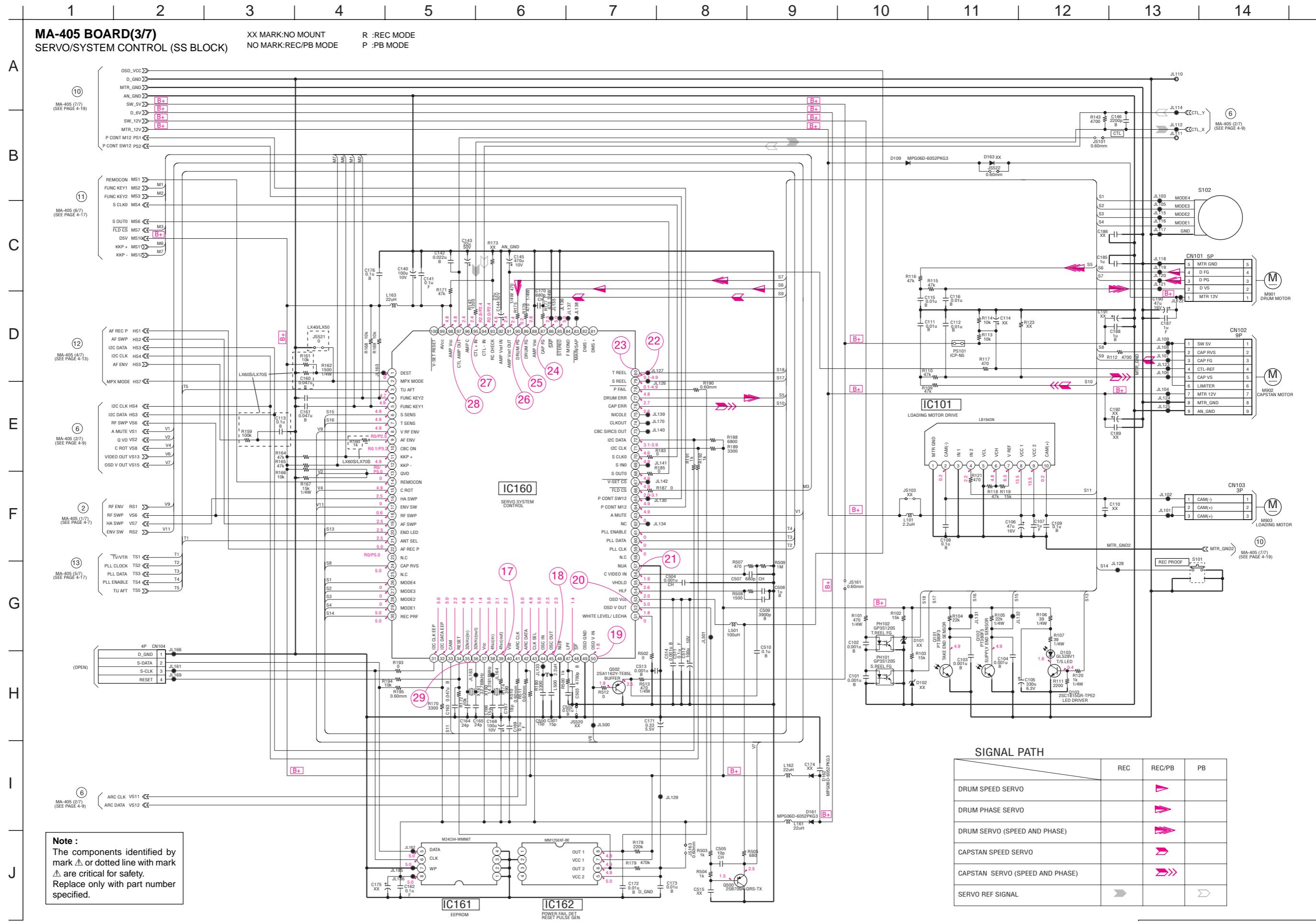
P : PB MODE



MA-405 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

– Ref. No: MA-405 board; 1000 series –

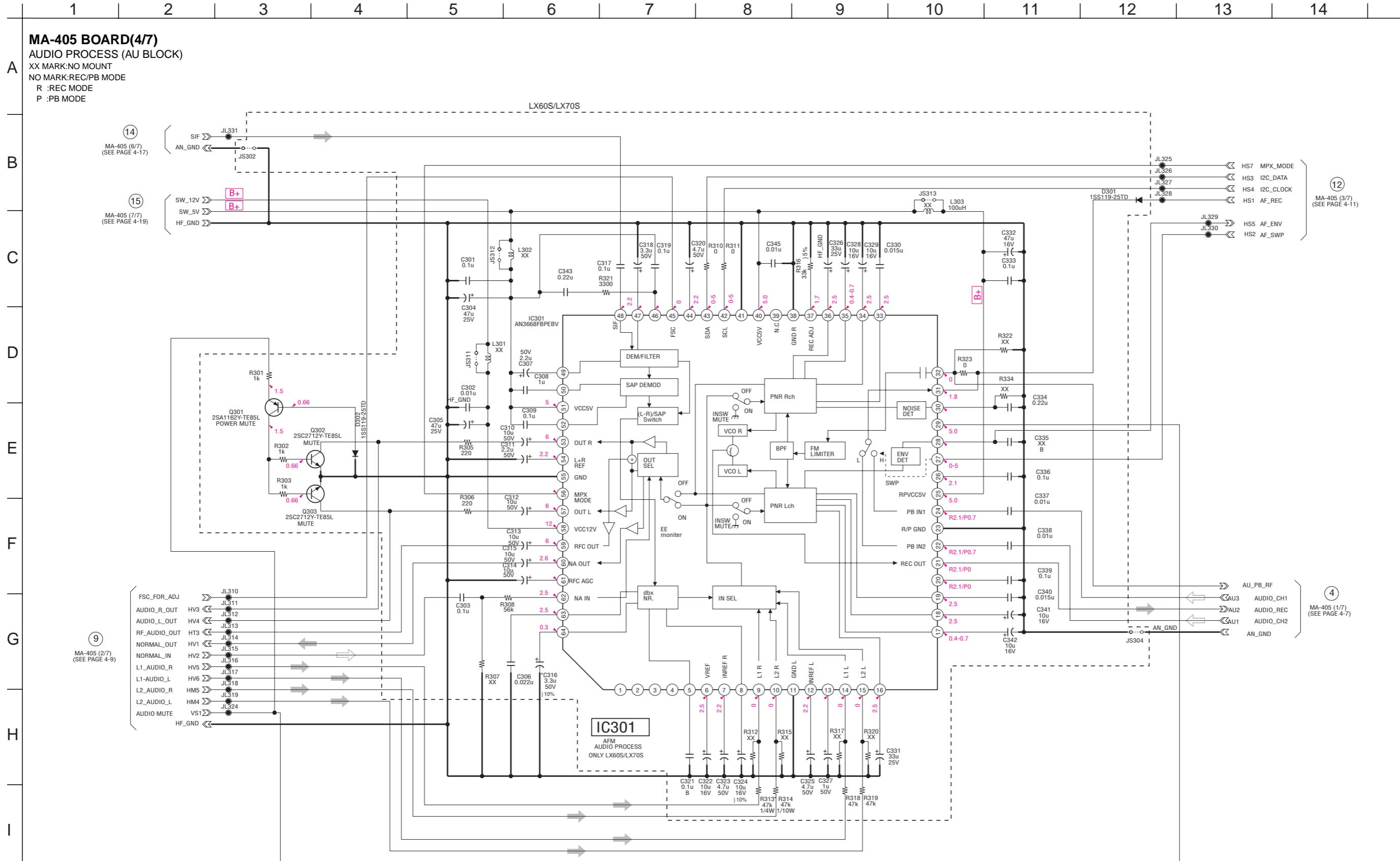
- See page 4-5 for printed wiring board.
- See page 4-21 for waveforms.



MA-405 (AUDIO PROCESS) SCHEMATIC DIAGRAM

– Ref. No: MA-405 board; 1000 series –

- See page 4-5 for printed wiring board.



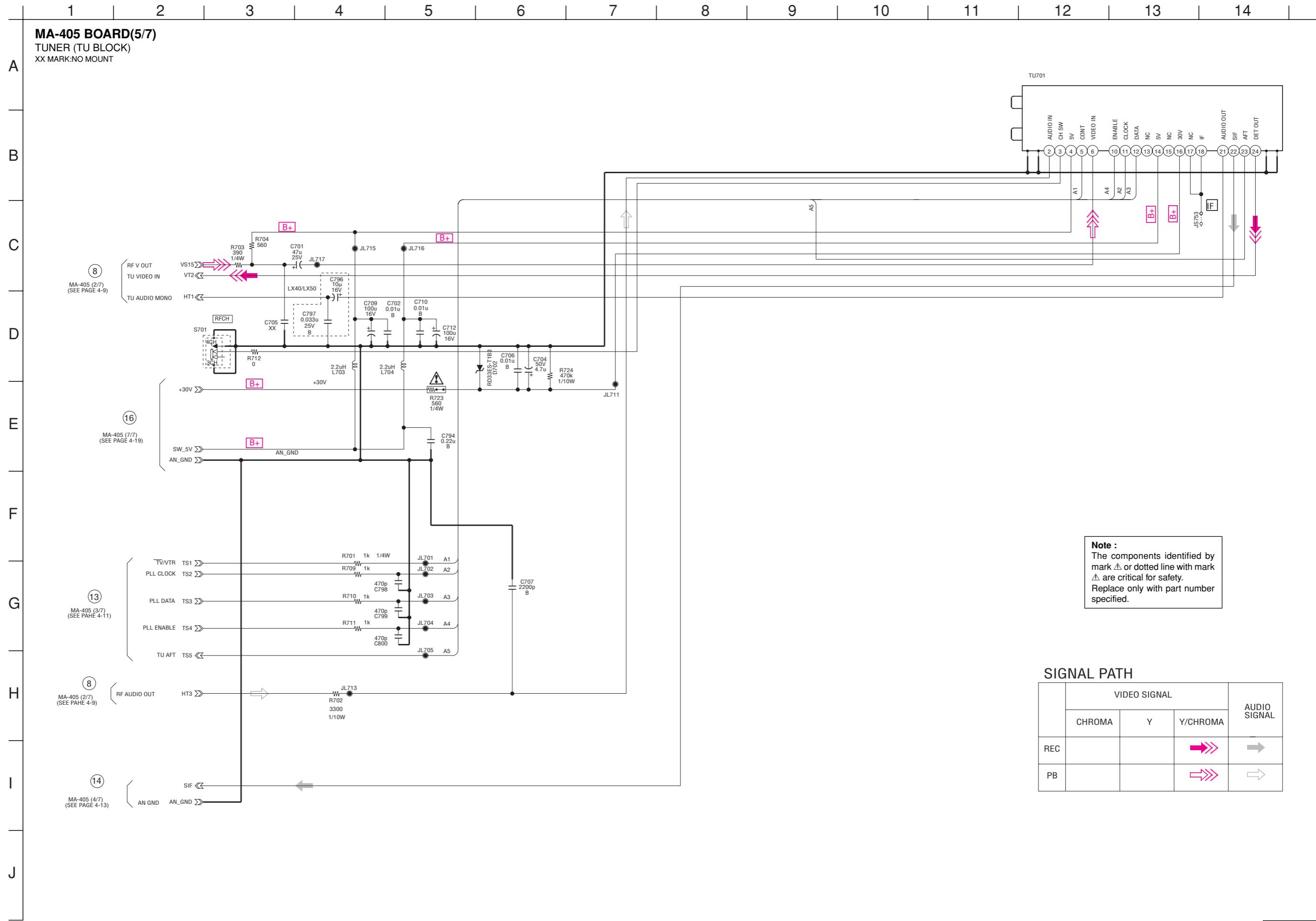
SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	

MA-405 (TUNER) SCHEMATIC DIAGRAM

– Ref. No: MA-405 board; 1000 series –

- See page 4-5 for printed wiring board.



Note :
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety.
Replace only with part number specified.

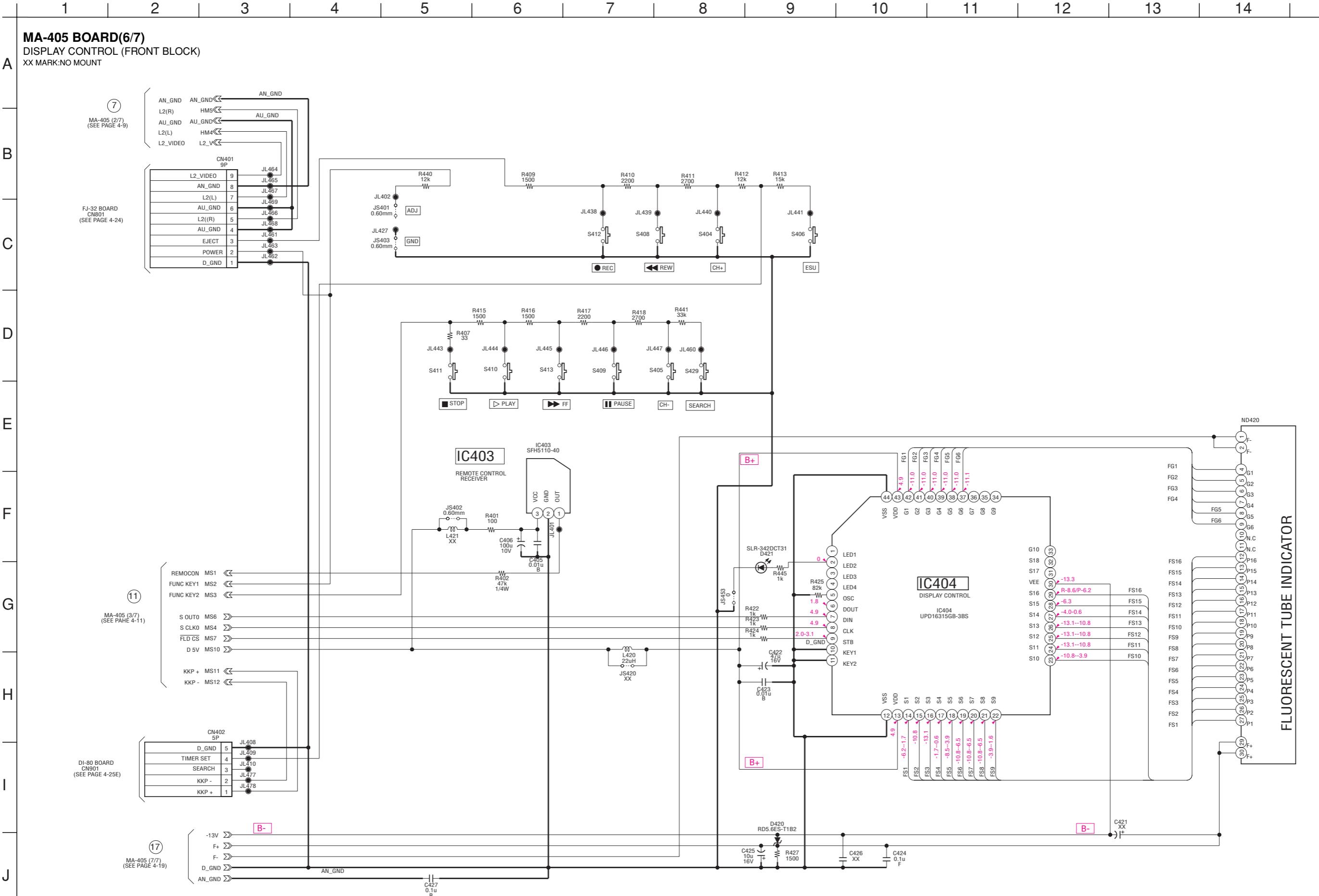
SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				

MA-405 (DISPLAY CONTROL) SCHEMATIC DIAGRAM

- Ref. No: MA-405 board; 1000 series -

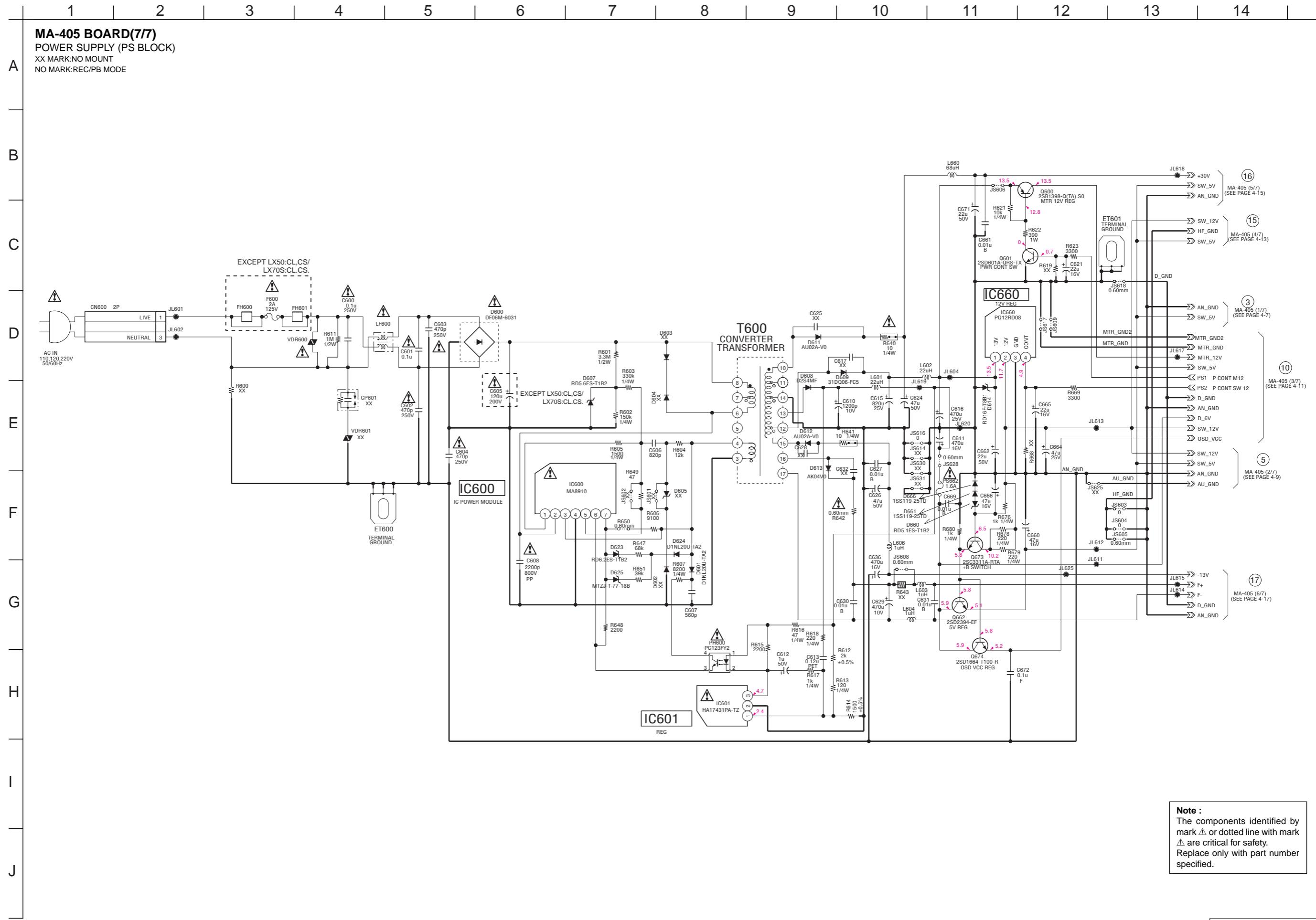
• See page 4-5 for printed wiring board.

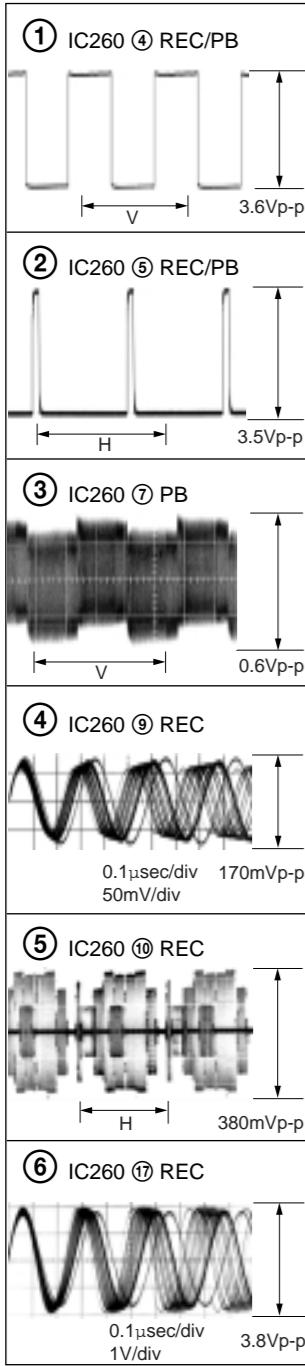
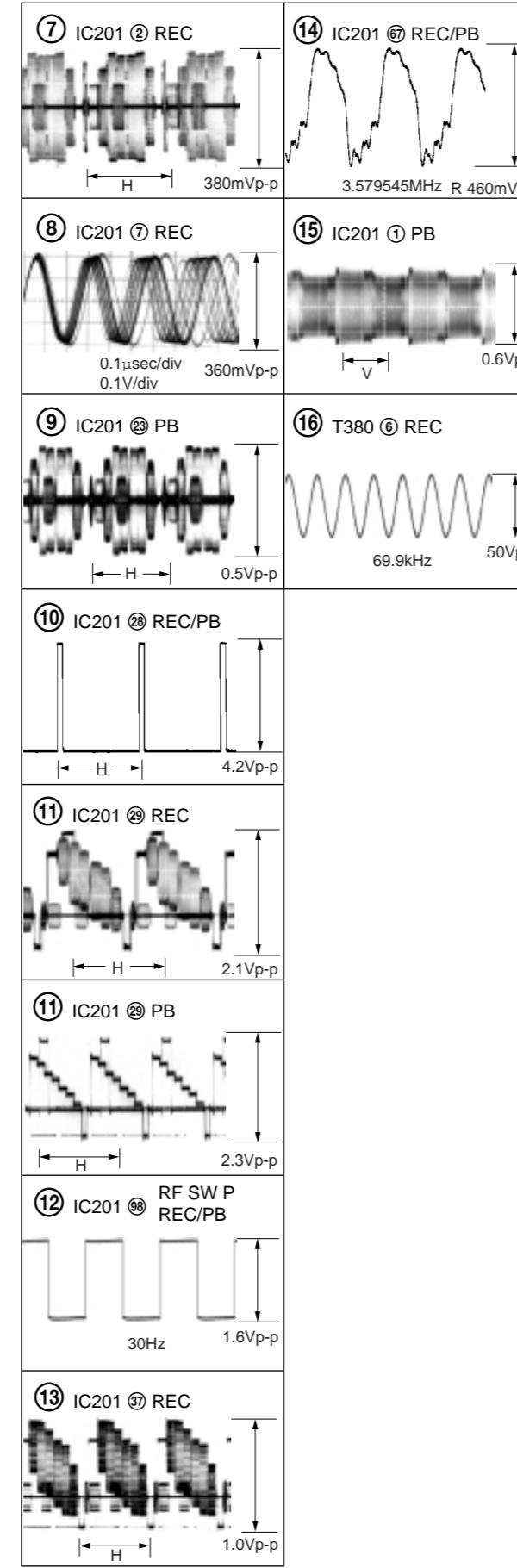
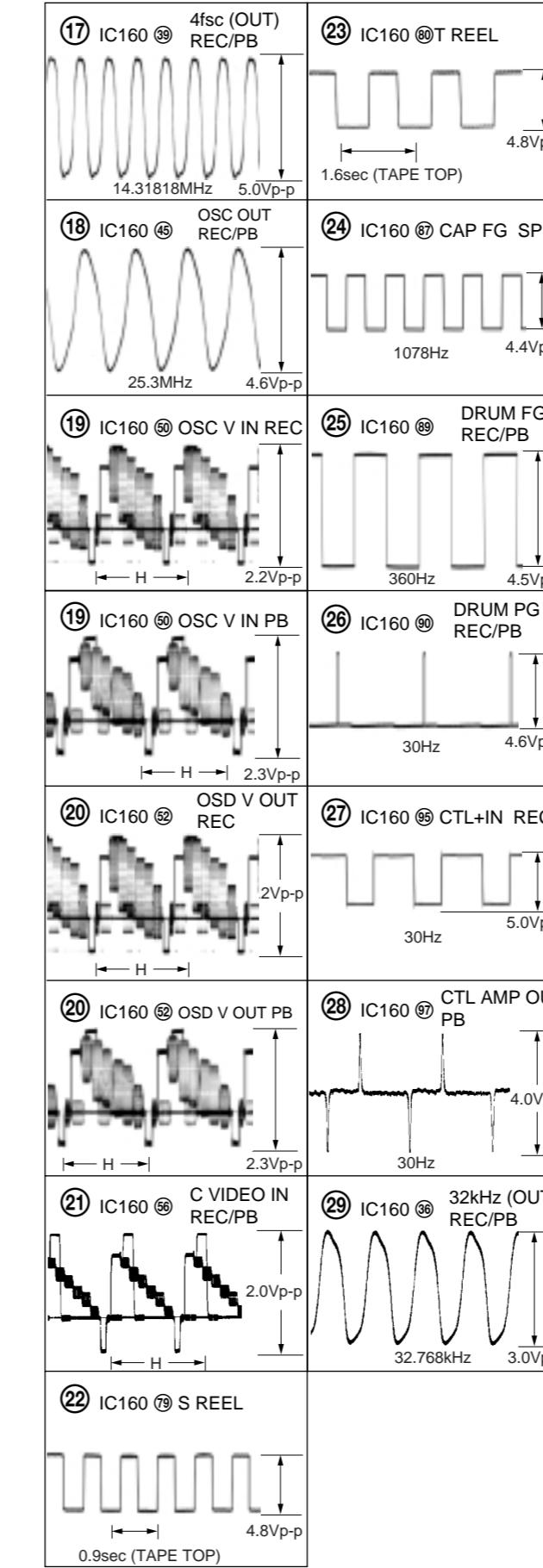


MA-405 (POWER SUPPLY) SCHEMATIC DIAGRAM

- Ref. No: MA-405 board; 1000 series -

• See page 4-5 for printed wiring board.



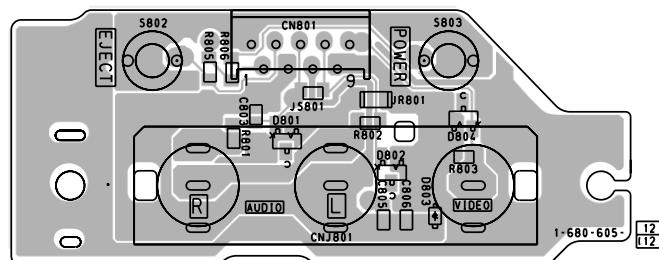
MA-405 BOARD (1/7)
(R/P BLOCK)MA-405 BOARD (2/7)
(VA BLOCK)MA-405 BOARD (3/7)
(SS BLOCK)

FJ-32 (LINE 2 IN) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. FJ-32 Board: 1,000 Series —

FJ-32 BOARD

There are few cases that the part printed on this diagram isn't mounted in this model.

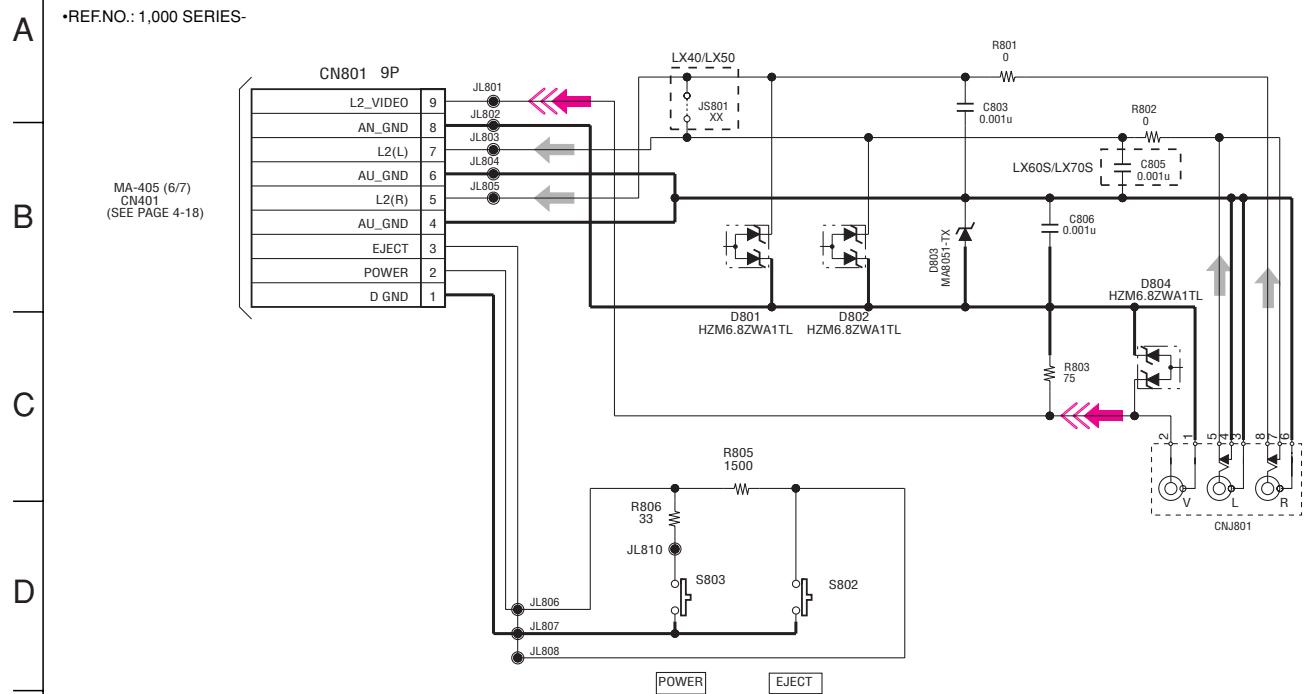


1 2 3 4 5 6 7

FJ-32 BOARD

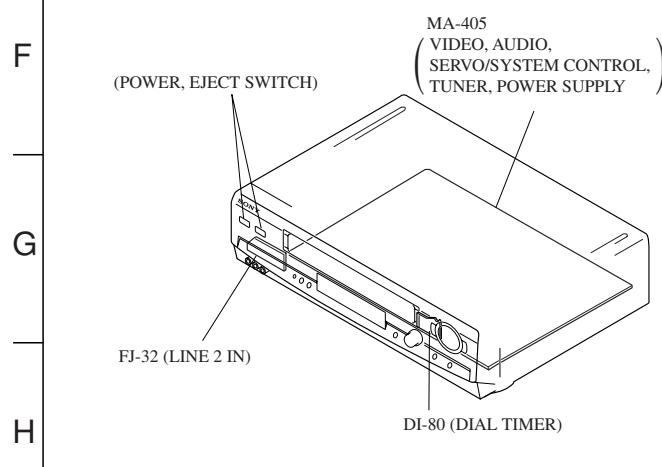
LINE 2 IN

•REF.NO.: 1,000 SERIES-



SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	➡
PB				

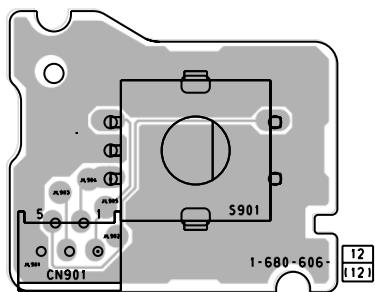


DI-80 (DIAL TIMER) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. DI-80 Board:1,000 Series —

DI-80 BOARD

There are few cases that the part printed on this diagram isn't mounted in this model.



1 2 3 4 5 6 7

DI-80 BOARD DIAL TIMER •REF.NO.: 1,000 SERIES-

A

B

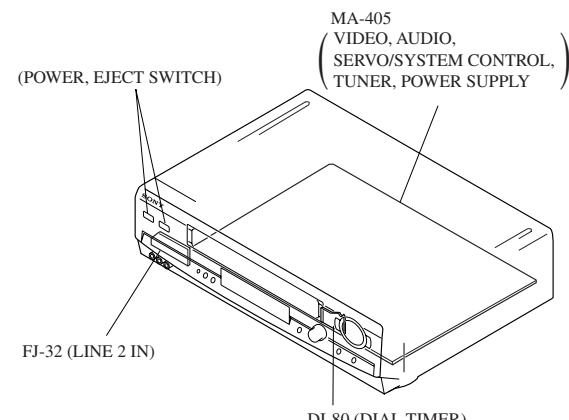
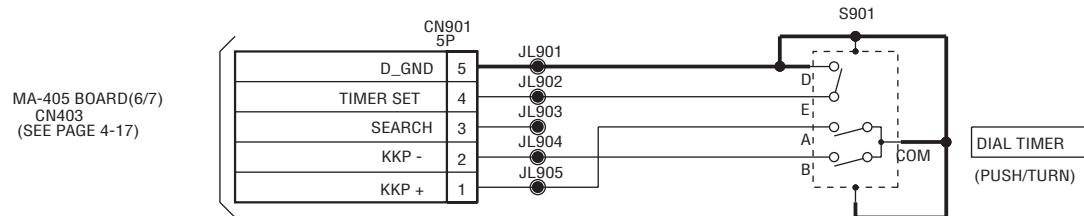
C

D

E

F

G



SECTION 5

INTERFACE, IC PIN FUNCTION DESCRIPTION

5-1. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTEREADING	STOP	FF	REW	PB	REC
CAM	MA-405 Board IC160 ⑬	O	*5	H	L	H	L	*5	*5	*5	*5	*5
MODE 1	MA-405 Board IC160 ⑨	I	—	—	—	—	—	H	H	H	H	H
MODE 2	MA-405 Board IC160 ⑧	I	—	—	—	—	—	L	L	L	H	H
MODE 3	MA-405 Board IC160 ⑦	I	—	—	—	—	—	H	H	H	L	L
MODE 4	MA-405 Board IC160 ⑥	I	—	—	—	—	—	H	L	L	L	L
REC PRF	MA-405 Board IC160 ⑩	I	L	*1	*1	*1	*1	*1	*1	*1	*1	*1
T REEL	MA-405 Board IC160 ⑧	I	H/L	H/L	H/L	H/L	H/L	H/L	*2	*2	*2	*2
S REEL	MA-405 Board IC160 ⑦	I	H/L	H/L	H/L	*2	*2	H/L	*2	*2	*2	*2
END LED	MA-405 Board IC160 ⑩	O	L	*3	*3	*3	*3	*3	*3	*3	*3	*3
T SENS	MA-405 Board IC160 ⑦	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4
S SENS	MA-405 Board IC160 ⑥	I	*3	*3	*3	*4	*4	*4	*4	*4	*4	*4

*1 "L" When erasing protection tab is bent. "H" when not bent.

*2 Pulse of period in proportion to reel rotating speed.

*3 Approx. 2 msec period "H" pulse when tape top or end is detected.

*4 Normally "L". 2 msec period "H" pulse when tape top or end is detected.

*5 Hi-Z

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTEREADING	PB	REC
CTL IN+	MA-405 Board IC160 ⑨	O	*7	*7	*7	*7	*7	*7	*1
DRUM PG	MA-405 Board IC160 ⑩	I	*3	*3	*3	*3	*3	*3	*3
DRUM FG	MA-405 Board IC160 ⑧	I	*4	*4	*4	*4	*4	*4	*4
CAP FG	MA-405 Board IC160 ⑦	I	H/L	*2	*2	*5	*5	*2	*2
CAP RVS	MA-405 Board IC160 ⑩	O	H/L	L	H	L	H	L	L
CAP ERR	MA-405 Board IC160 ⑦	O	L	*6	*6	*6	*6	*6	*6
DRUM ERR	MA-405 Board IC160 ⑧	O	*6	*6	*6	*6	*6	*6	*6

*1. 30Hz pulse.

*2. Pulse of period in proportion to tape speed.

*3. 30Hz "H" pulse.

*4. 720 Hz pulse.

*5. Unstable period pulse.

*6. DC voltage 1 – 5V.

*7. Hi-Z (2.5V)

5-3. SYSTEM CONTROL — SYSTEM CONTROL PERIPHERAL CIRCUIT INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	I/O level
RESET	MA-405 Board IC160 ④	I	Normally "H", "L" when service interruption detected or restored.
I2C DATA 1	MA-405 Board IC160 ②	I/O	Serial communication data to EEPROM I2C161.
I2C CLOCK 1	MA-405 Board IC160 ①	O	Serial communication clock to EEPROM I2C161.
I2C DATA VIDEO	MA-405 Board IC160 ⑦	I/O	Serial communication data to video and audio microprocessor.
I2C CLOCK VIDEO	MA-405 Board IC160 ⑥	O	Serial communication clock to video and audio microprocessor.
(ARC) S OUT 1	MA-405 Board IC160 ②	I/O	Serial communication data to ARC microprocessor.
(ARC) CLK 1	MA-405 Board IC160 ①	O	Serial communication clock to ARC microprocessor.

5-4. SYSTEM CONTROL AND RF MODULATOR — INPUT SELECTION BLOCK INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	I/O level
ANT SEL	MA-405 Board IC160 ②	O	"H" when RF modulator through.

5-5. SYSTEM CONTROL — VIDEO/RP BLOCK INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	STOP/FF /REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC/PAUSE
RF SWP	MA-405 Board IC160 ⑩	O	*1	*1	*1	*1	*1	*1
QVD	MA-405 Board IC160 ⑨	O	L	L	L	*2	L	L
C SYNC	MA-405 Board IC160 ⑧	I	*3	*3	*3	*3	*3	*3

*1. Synchronized with drum rotation, 30Hz 50% duty pulse.

*2. Normal "L", "H" when video signal is not regenerated.

*3. Composite sync signal (positive).

5-6. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-405 BOARD IC160)

Signal	Pin No.	I/O	STOP/FF /REW	TAPE LOADING	TAPE UNLOADING	PB	REC	REC/PAUSE
A MUTE	MA-405 Board IC160 ⑩	O	L	L	L	L	L	L
AF REC P	MA-405 Board IC160 ⑨	O	L	L	L	L	H	L

5-7. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-405 BOARD IC160)

Pin No.	Pin Name	I/O	Function
1	DEST	I	Destination control input
2	MPX MODE	I	STEREO/MONO/SAP DETECTION
3	TU AFT	I	Tuner analog AFT input
4	FUNC KEY2	I	Key input
5	FUNC KEY1	I	Key input
6	S SENS	I	Tape end sensor input
7	T SENS	I	Tape top sensor input
8	V RF ENV	I	Video playback signal envelope input
9	AF ANV	I	Hi-Fi audio playback signal envelope input
10	CBC ON	O	Cable box control signal output
11	KKP+	I	ETR pulse signal input
12	KKP-	I	ETR pulse signal input
13	QVD	O	Quasi VD pulse output
14	REMOCON	I	Remote sires signal input
15	C ROT	O	Head AZ signal output
16	HA SWP	O	SP/EP changed head signal
17	ENV SW	I	SP/EP head output label ditaction signal
18	RF SWP	O	VIDEO RF switching pulse output.
19	AF SWP	O	AF switching pulse output.
20	END LED	O	END sensor LED output
21	ANT SEL	O	TV/VTR RF modulator control output
22	AF REC P	O	Hi-Fi record control pulse output.
23	FE ON	—	NC
24	CAP RVS	O	Capstan reverse control
25	SUR ON	—	NC
26	MODE4	I	Mechanism section CAM encoder input (data4)
27	MODE3	I	Mechanism section CAM encoder input (data3)
28	MODE2	I	Mechanism section CAM encoder input (data2)
29	MODE1	I	Mechanism section CAM encoder input (data1)
30	REC PRF	I	Erasing protection tab, cassette IN detection input
31	I2C CLK EEP	I/O	HC CLOCK line (EEPROM)
32	I2C DATA EEP	I/O	HC DATA line (EEPROM)
33	CAM	O	Cam motor control signal output
34	RESET	I	System reset input
35	32kHz (in)	I	Sub clock 32MHz
36	32kHz (out)	O	Sub clock 32MHz
37	Vcc	I	5V
38	4fsc (in)	I	Main clock input
39	4fsc (out)	O	Main clock output
40	Vss	—	Ground
41	ARC CLK	O	Realityregenerator (ARC) control clock signal
42	ARC DATA	O	Realityregenerator (ARC) control data signal
43	CLK SEL	I	CLOCK seleal "L" Sub clock, "H" main and sub clock.
44	OSC IN	I	OSD clock input
45	OSC OUT	O	OSD clock output
46	NUB	—	Ground
47	LPF	I/O	fsc filter
48	SP	O	"L" output when SP mode.
49	OSD GND	—	Ground
50	OSD V IN	I	OSD Video signal input.

Pin No.	Pin Name	I/O	Function
51	WHITE LEVEL	I	White level signal input
52	OSD V OUT	O	OSD Video signal output
53	OSD Vcc	—	SW 5V (OSD block)
54	HLF	I/O	External low-pass filter for slicer/AFC is connected to this terminal
55	V HOLD	I/O	External capacitor for slicer is connected to this terminal
56	C VIDEO IN	I	Control video signal input (osd, tuner, sorvo)
57	NUA	—	D Ground
58	C SYNC	I	NC
59	PLL CLK	O	Tuner PLL clock output
60	PLL DATA	O	Tuner PLL data output
61	PLL ENABLE	O	Tuner enable output
62	TA MUTE	O	NC
63	A MUTE	O	AUDIO mute output
64	P CONT M12	O	Motor 12V control output
65	P CONT SW12	O	SW 12V control output
66	FLD CS	O	FLD drive chip select signal output
67	V-SET CS	O	V-set micon chip select signal output
68	S OUT0	O	Serial communication signal (FLD, V-SET)
69	S IN 0	I	NC
70	S CLK 0	O	Serial communication signal (FLD, V-SET)
71	I2C CLK	I/O	IIC clock signal (VIDEO, HiFi)
72	I2C DATA	I/O	IIC data signal (VIDEO, HiFi)
73	CBC SIRCS OUT	O	Cable mouse sircs signal output
74	CLK OUT	—	NC
75	NICOLE	O	NC
76	CAP ERR	O	Capstan error D/A output
77	DRUM ERR	O	Drum error D/A output
78	P FAIL	I	Power fail detection input
79	S REEL	I	Supply reel sensor input
80	T REEL	I	Take up reel sensor input
81	DMS+	I	
82	DMS-	I	
83	MAIN/SAP	O	
84	F MONO	O	
85	STEREO	I	Ground
86	SAP	I	Ground
87	CAP FG	I	Capstan FG signal input
88	AMP Vss	—	Ground
89	DRUM FG	I	Drum FG input.
90	DRUM PG	I	Drum PG input.
91	AMP Vref OUT	O	Analog AMP reference Vcc output
92	AMP Vref IN	I	Analog AMP reference Vcc input
93	RC CHECK	I	Check input
94	CTL-IN	I/O	Control signal IN/OUT
95	CTL+IN	I/O	Control signal IN/OUT
96	AMP C	I	Control signal AC conect
97	CTL AMP OUT	O	Control signal AMP output
98	AMP Vcc	—	D-5V
99	A Vcc	—	D-5V
100	V-SET RESET	O	NC

SECTION 6

ADJUSTMENTS

6-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL VI (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 6-6 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

- 1) Monitor TV
- 2) Oscilloscope, dual-trace, bandwidth of 30 MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
- 3) Frequency counter
- 4) NTSC Pattern generator
- 5) Remote commander
- 6) Digital voltmeter
- 7) Audio generator
- 8) Audio level meter
- 9) Audio attenuator
- 10) Alignment tapes

KRV-51N2 (NTSC) Part No. : 8-192-605-32

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

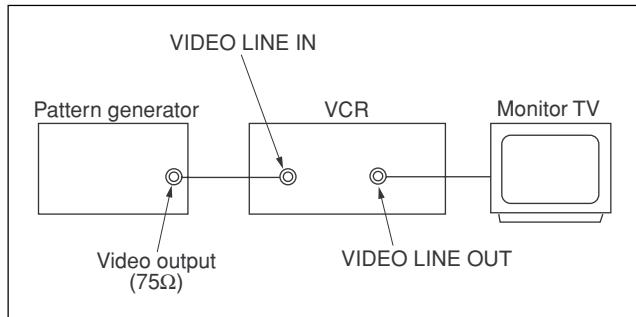


Fig. 6-2-1

2-1-3. Set-up of Adjustment

In this adjustment, NTSC pattern generator is connected with LINE input terminal. When check to tuner, connected AERIAL terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7 V and that the burst signal has an amplitude of approximately 0.3 V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

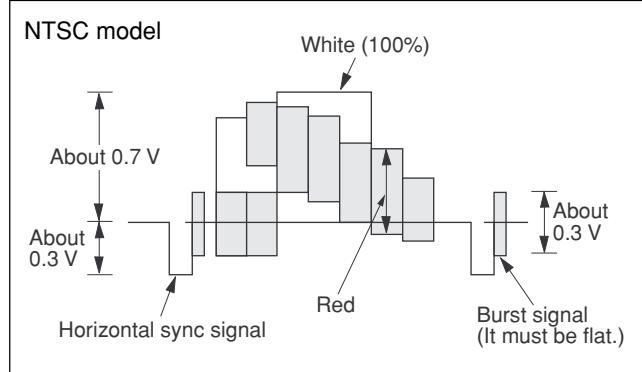


Fig. 6-2-2 Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

- Contents of KRV-51N2

	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

2-1-5. Input/Output Levels and Impedance

Video input: LINE IN

Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

Video output: LINE OUT

Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

Audio input: LINE IN

Input level: -7.5 dBs

(0 dBs = 0.775 Vrms)

Input impedance: more than 47 kilohms

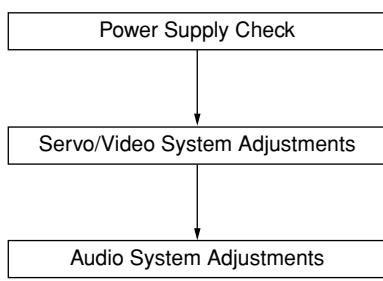
Audio output: LINE OUT

Standard level: -7.5 dBs at load impedance 47 kilohms

Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-405 Board)

Mode	STANDBY
+30 V Check	
Measurement point	C671 \oplus
Specified value	31.0 to 39.0 V
-11 V Check	
Measurement point	Anode of D420
Specified value	-12.5 to -9.5 V
D+6 V Check	
Measurement point	Collector of Q674
Specified value	5.56 to 6.25 V

Mode	E-E
Measuring Instrument	Digital voltmeter
SW+12 V Check	
Measurement point	IC660 pin ②
Specified value	11.7 to 12.3 V
SW+5 V Check	
Measurement point	Emitter of Q662
Specified value	4.8 to 5.4 V
MTR12 V Check	
Measurement point	Collector of Q600
Specified value	12.5 to 14.5 V
F Check	
Measurement point	ND420 ⑩ to ①
Specified value	2.0 to 5.0V

[Check Method]

- 1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

2-3-1. RF Switching Position Adjustment (MA-405 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: CN270 pin ② (PB RF) CH2: CN270 pin ③ (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	Remote Commander CH+/-
Specified value	A=minimize

[Adjustment Method]

- 1) Playback the alignment tape.
- 2) Short JS401 to Ground.
- 3) Check that "A P" is indicated on FL display.
- 4) Adjust so that part A becomes minimized at CH +/-.
- 5) Write data in EEPROM by pressing PAUSE button.

Monoral model:

- 6) The display "A P" disappears and then the Adjustment mode terminates.

Hi-Fi model:

- 6) The display changes to "A H" and the mode goes to the HiFi switching position Adjustment.(2-4-2.)

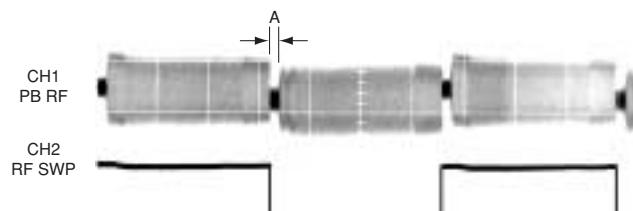


Fig. 6-2-3

2-4. AUDIO SYSTEM ADJUSTMENT

- Adjust both L ch and R ch.

[Connecting Instruments]

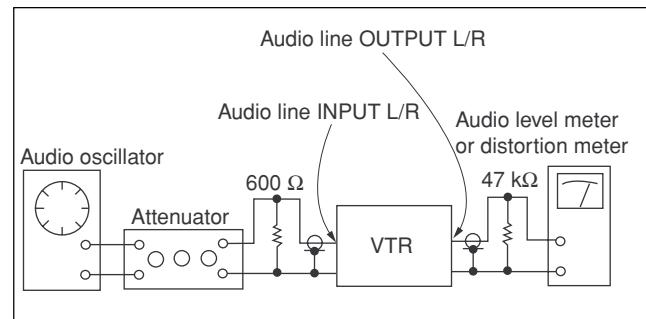


Fig. 6-2-4

2-4-1. Hi-Fi Audio System Adjustment (Hi-Fi model only)

- Perform the adjustment setting the switch on the following positions.
- AUDIO MONITOR STEREO

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual VI (S MECHANISM)(9-921-647-11).
2. E-E output level check
3. "Recording Bias Adjustment"

2-4-2. HiFi Switching Position Adjustment (MA-405 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Pin ① of CN270 (HF ADJ) CH2: Pin ③ of CN270 (RF SWP)
Measuring instrument	Oscilloscope
Adjusting element	Remote Commander CH +/-
Specified value	B=minimize

[Adjustment Method]

- 1) Check that "A H" is indicated on FL display.
- 2) Adjust so that part B becomes minimized at CH +/-.
- 3) Write data EEPROM by pressing PAUSE button.
- 4) Check that "A H" indicator turns off.
- 5) If "A H" indicator is still on, restart RF switching position Adjustment from the beginning.

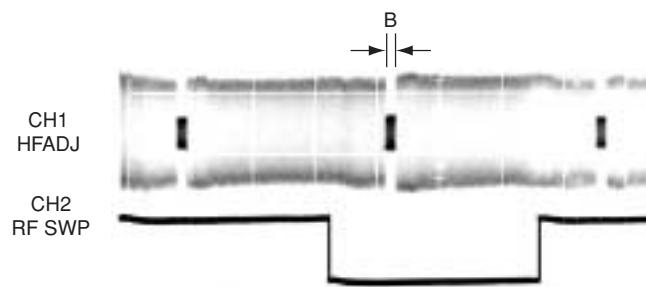


Fig. 6-2-5

2-4-3. Normal Audio System Adjustment

- Make adjustment in the SP mode unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

2-4-4. Audio Level and Distortion Check

[Adjustment purpose]

Confirm that the audio level and distortion is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, -7.5 dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter and distortion meter
Specified value	PB level : -7.5 ± 2 dBs (HIFI) PB level : -7.5 ± 3 dBs (MONO) Distortion : less than 1% (HIFI) Distortion : less than 4% (MONO)

[Confirmation Method]

- 1) Supply a signal of 400 Hz, -7.5 dBs to both L and R channels of Audio Line Input.
- 2) Record the tape.
- 3) Playback a recorded portion of the tape.
- 4) Confirm that the playback output level of audio level meter is within of range -7.5 ± 2 dBs for HIFI and -7.5 ± 3 dBs for MONO.
- 5) Confirm that the output of distortion meter is less than 1% for HIFI and 4% for MONO.

2-4-5. Audio Noise Check

[Adjustment purpose]

Confirm that the noise level is within the specification.

Mode	REC and PB (SP mode)
Signal	No signal input
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	Less than -67.5dBs (HIFI) Less than -45.5dBs (MONO)

[Confirmation method]

- 1) Audio line input L and R channels are shorted to the ground.
- 2) Record the tape.
- 3) Playback a recorded portion of the tape.
- 4) Confirm that the output level is less than -67.5dBs for HIFI and -45.5dBs for MONO.

2-4-6. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual VI (S MECHANISM) (9-921-647-11).

2-4-7. E-E Output Level Check

[Adjustment purpose]

Confirm that the output level adjust the reference input is within the specification.

Mode	E-E
Signal	400 Hz, -7.5 dBs
Measurement point	CNJ562 L/R
Measuring instrument	Audio level meter
Specified value	-7.5 ± 2 dBs

[Check Method]

- 1) Input signal of 400 Hz and -7.5 dBs to the CNJ562 L/R.
- 2) Check that the audio output level is -7.5 ± 2 dBs.

2-4-8. Frequency Response Check

[Adjustment purpose]

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, -17.5 dBs 7 kHz, -17.5 dBs
Measurement point	CNJ562 L/R
Measuring instrument	Audio level meter
Specified value	0 ± 3 dB

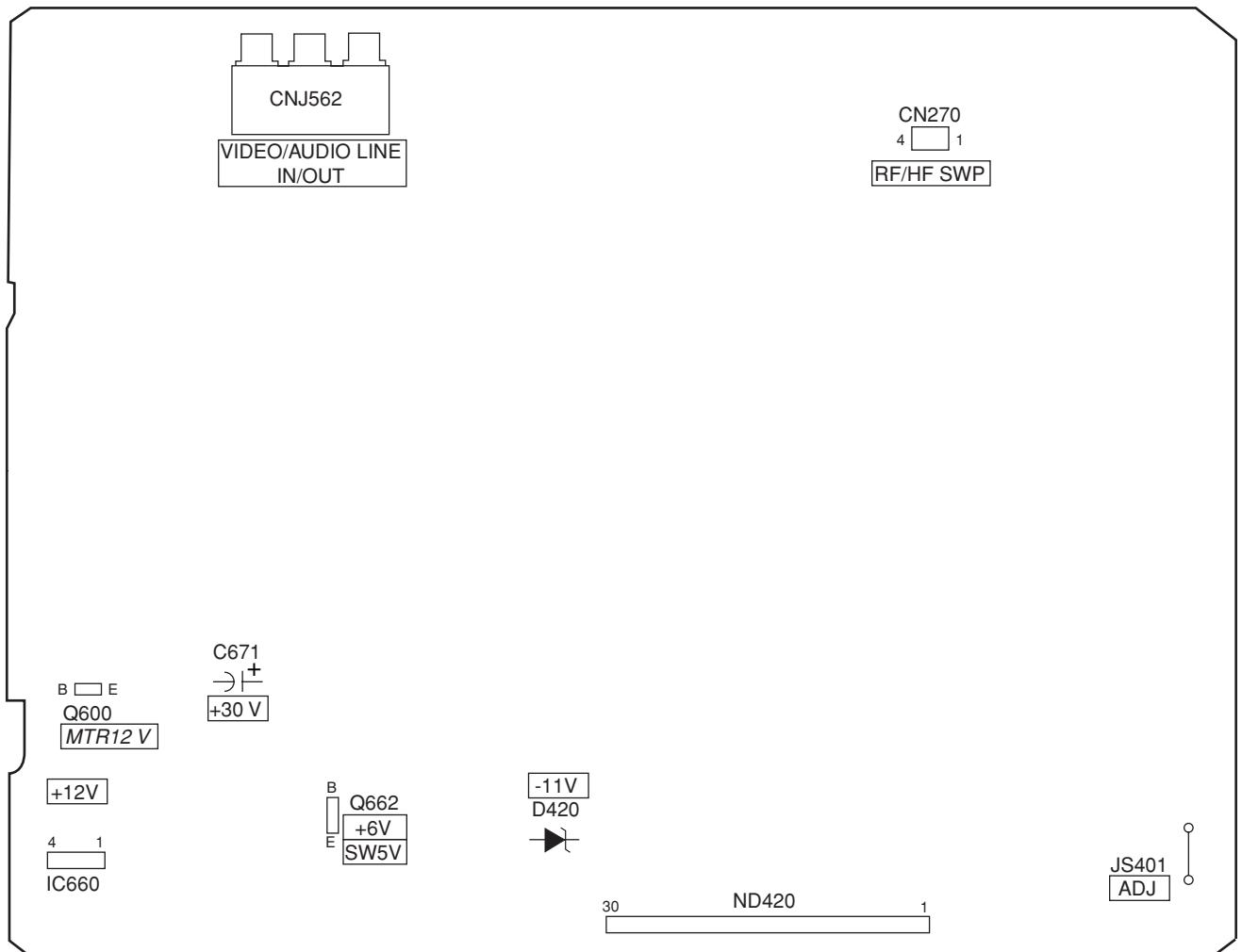
Note: Tape path adjustment must have been completed.

[Confirmation Method]

- 1) Supply a signal of 400 Hz, -17.5 dBs to CNJ562 L/R.
- 2) Connect the audio level meter to CNJ562 L/R.
- 3) Adjust the attenuator so that the audio level meter will indicate -17.5 dBs.
- 4) Make recording in the SP mode.
- 5) Set an audio line input signal to 7 kHz and make recording.
- 6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
- 7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0 ± 3 dB.

2-5. ADJUSTING PARTS LOCATION DIAGRAM

MA-405 BOARD
(CONDUCTOR SIDE)



SECTION 7

REPAIR PARTS LIST

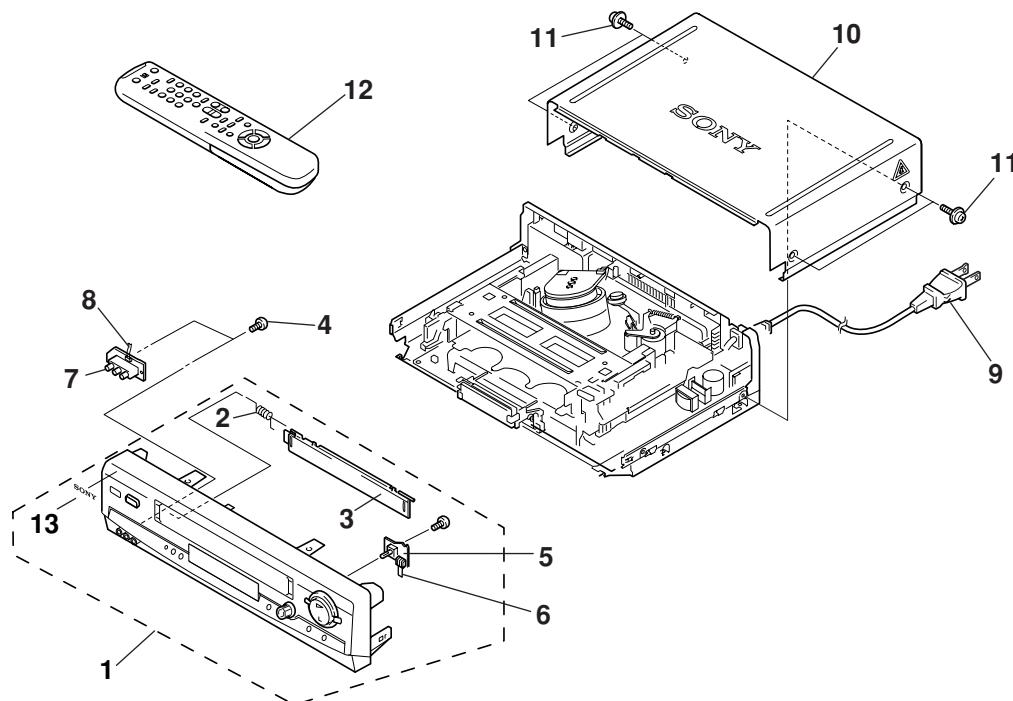
7-1. EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

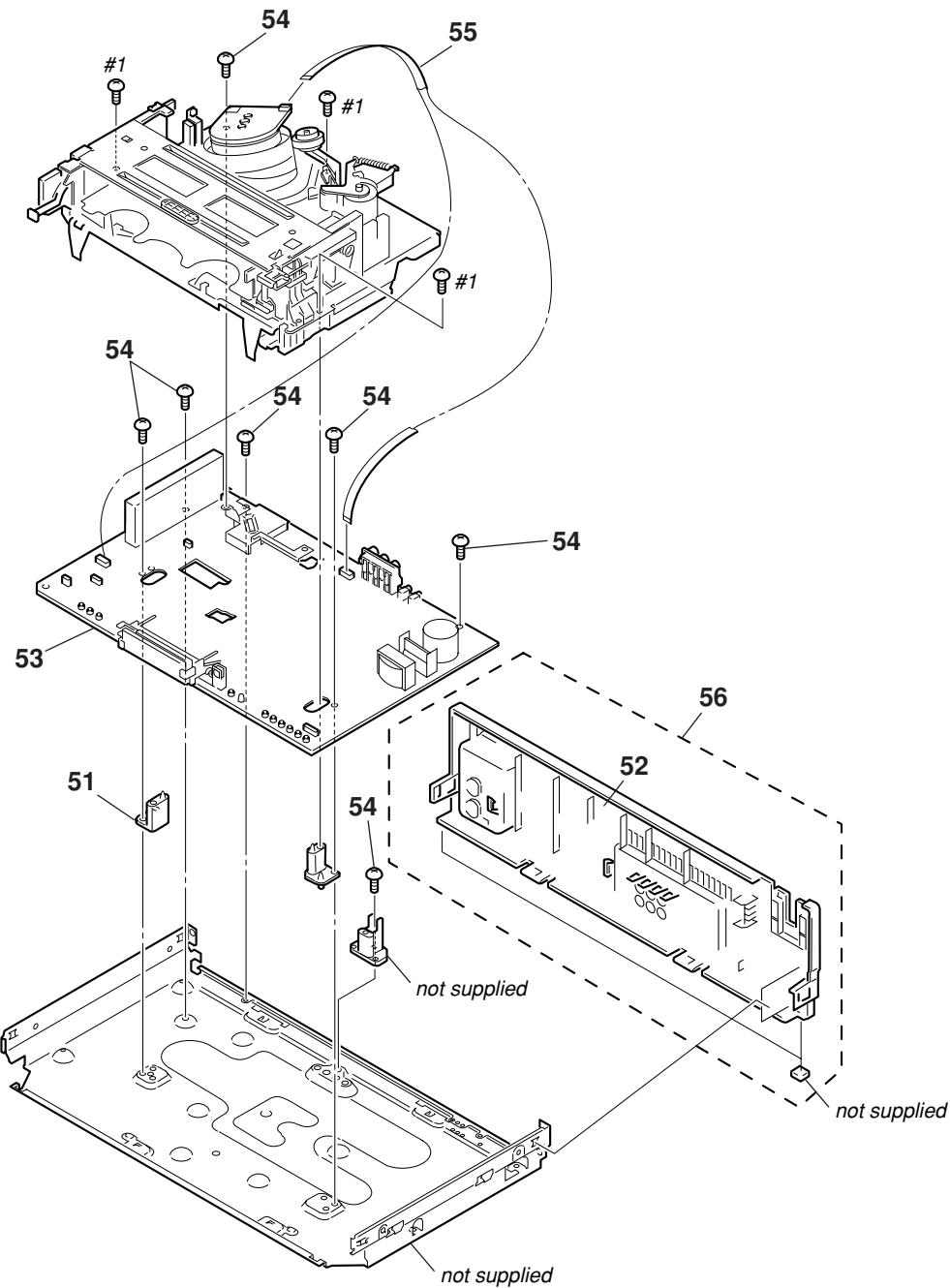
The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

7-1-1. FRONT PANEL AND UPPER CASE SECTION



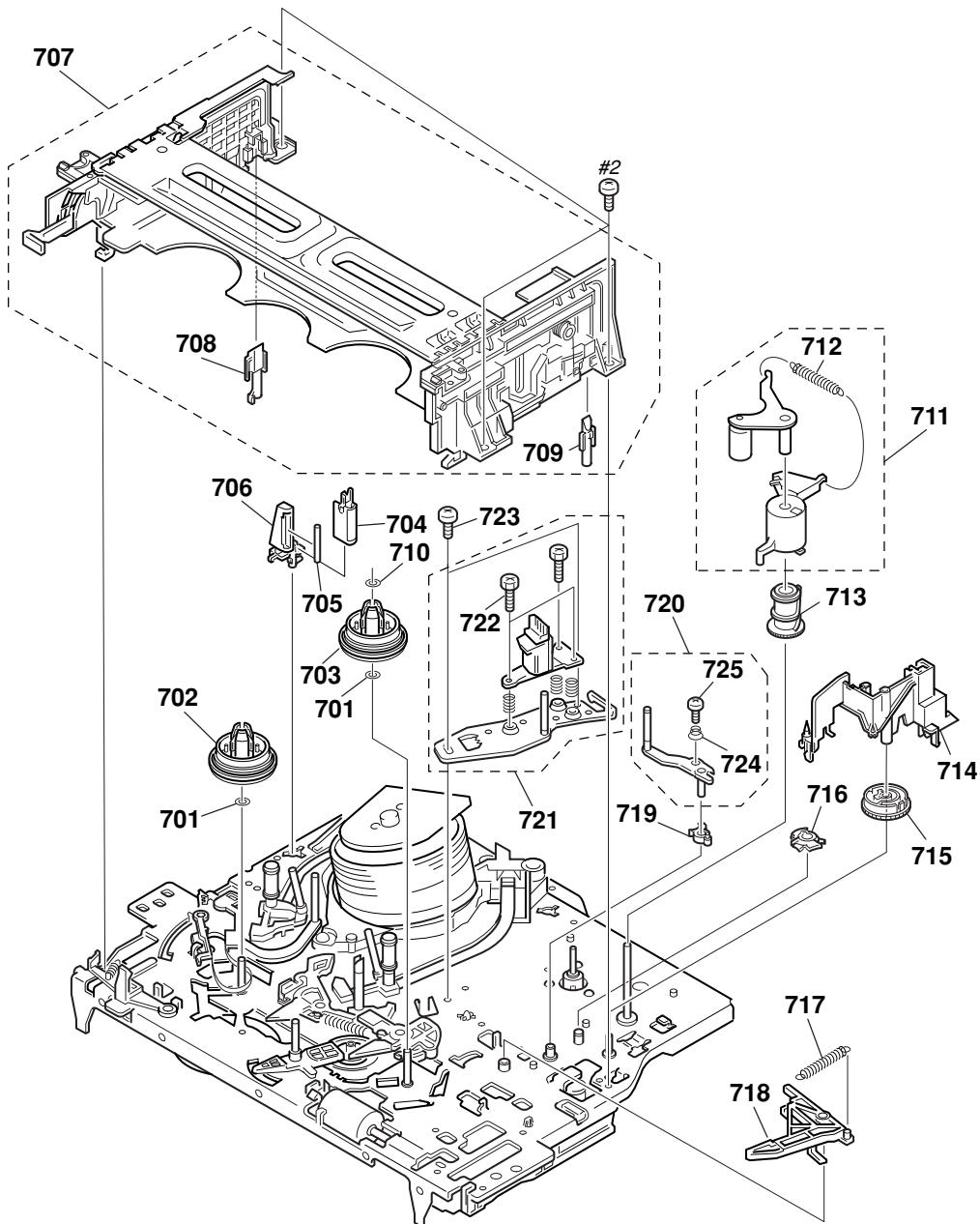
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-3951-118-1	PANEL ASSY, FRONT (LX40)		\triangle 9	1-777-852-12	CORD, POWER (LX40/LX50:MX,PA,PC,VZ/ LX60S/LX70S:MX,PA,PC,VZ)	
1	X-3951-120-1	PANEL ASSY, FRONT (LX50)		\triangle 9	1-782-000-33	CORD, POWER (LX50:CL,CS/LX70S:CL,CS)	
1	X-3951-119-1	PANEL ASSY, FRONT (LX60S)		10	3-053-307-61	CASE, UPPER	
1	X-3951-121-1	PANEL ASSY, FRONT (LX70S)		11	3-710-901-01	SCREW, TAPPING	
2	3-951-089-01	SPRING (GE), FL (LX40/LX50)		12	1-476-436-11	COMMANDER, STANDARD (RMT-V293A) (LX40/LX50)	
2	3-951-089-01	SPRING (GE), FL (LX60S/LX70S)		12	1-476-437-11	COMMANDER, STANDARD (RMT-V294A) (LX60S/LX70S)	
3	3-058-039-11	DOOR, CASSETTE		13	3-943-995-51	EMBLEM (NO.5), SONY	
4	4-921-277-41	SCREW(B2.6×8), TAPPING, BIND					
* 5	A-6794-813-A	DI-080 MOUNT					
6	1-757-552-12	CABLE, FLAT FDM-010					
* 7	A-6794-814-A	FJ-032 MOUNT (LX60S/LX70S)					
* 7	A-6794-815-A	FJ-032 MOUNT (LX40/LX50)					
8	1-757-556-11	CABLE, FLAT FFJ-004					

7-1-2. CHASSIS SECTION



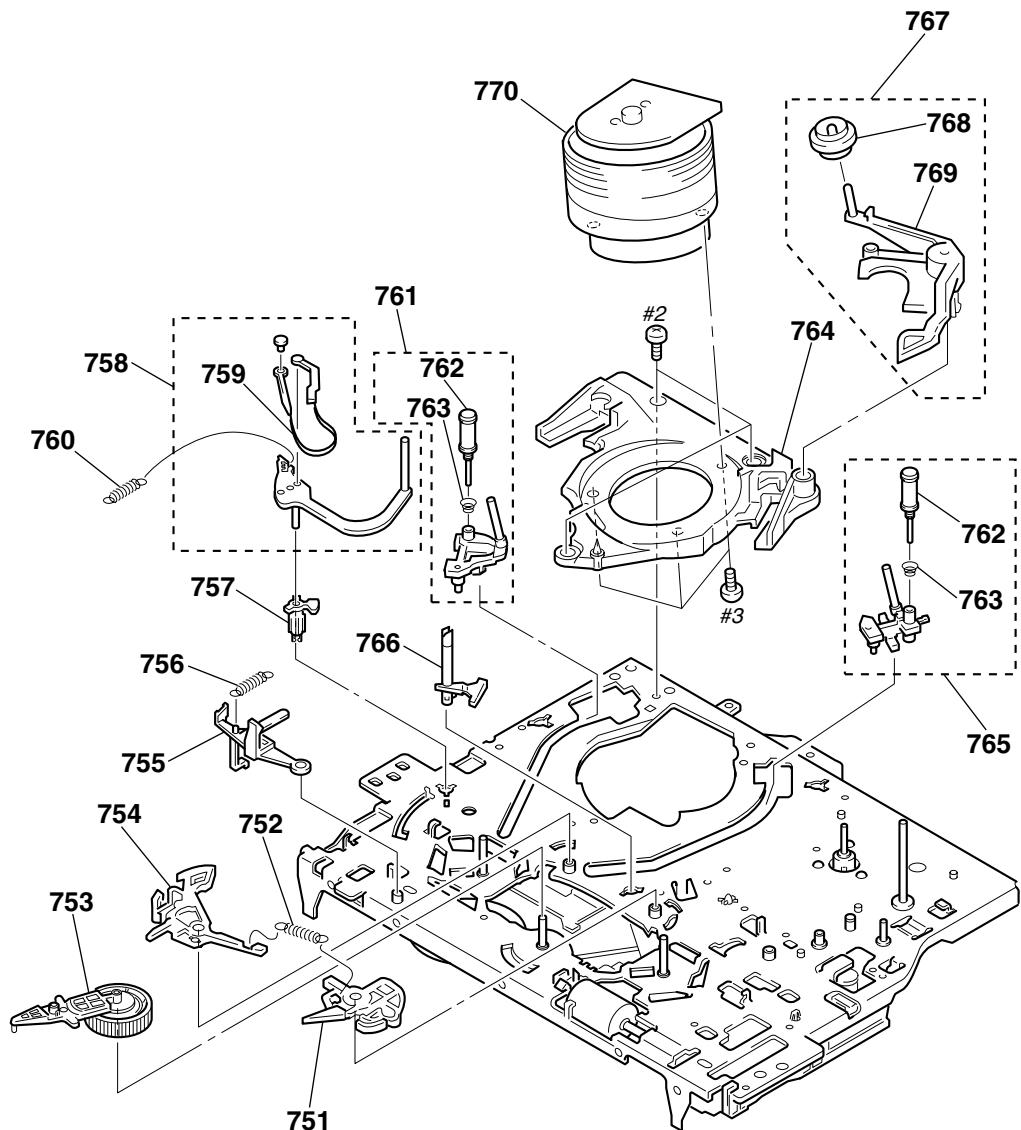
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	3-959-383-01	BASE (R), MD		* 53	A-6713-829-A	MA-405 COMPLETE PC BOARD (LX40/LX50:MX,PA,PC,VZ)	
52	3-987-076-11	PANEL, REAR		54	3-970-608-21	SUMITITE (B3), +BV	
53	A-6713-826-A	MA-405 COMPLETE PC BOARD (LX50:CL,CS)		55	1-791-857-11	CABLE, FLAT (FMD-21)	
* 53	A-6713-827-A	MA-405 COMPLETE PC BOARD (LX60S/LX70S:MX,PA,PC,VZ)		56	X-3950-107-1	PANEL ASSY, REAR	
* 53	A-6713-828-A	MA-405 COMPLETE PC BOARD (LX70S:CL,CS)		#1	7-685-648-79	SCREW + BVTP 3 x 12 TYPE2 IT-3	

7-1-3. MECHANISM DECK SECTION-1



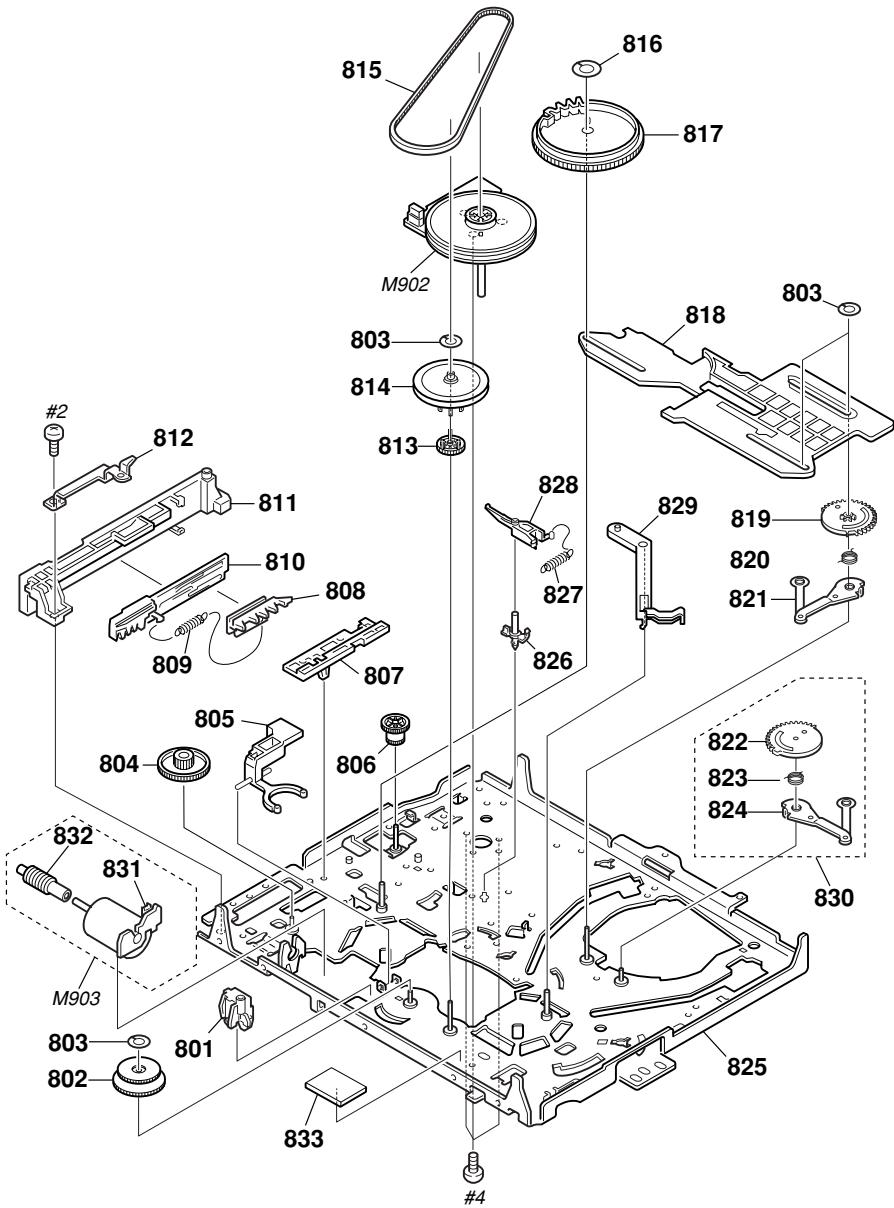
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST		714	3-977-514-01	OPENER, LID (SL)	
702	3-977-507-01	TABLE, REEL (S) (GRAY)		715	3-977-441-03	GEAR, PINCH PRESSING	
703	3-977-508-01	TABLE, REEL (T) (BLACK)		716	3-977-445-02	GEAR, TG8 ARM DRIVING	
704	1-500-144-11	HEAD, FE		717	3-977-465-01	SPRING, EXTENSION (RVS BRAKE)	
705	3-977-495-01	SHAFT, TG2		718	3-977-446-01	ARM ASSY, RVS BRAKE (SL)	
706	3-977-494-01	HOLDER, FEH		719	3-977-446-01	GEAR, TG8 ARM	
707	A-6759-619-B	FL COMPLETE ASSY BOARD, COMPLETE		720	X-3947-590-1	TG8 ASSY	
708	3-977-535-01	PLATE, LUMINOUS (END SENSOR)		721	A-6759-620-A	HEAD BLOCK ASSY, ACE	
709	3-977-536-01	PLATE, LUMINOUS (TOP SENSOR)		722	3-974-556-11	+ HEXA TT 2.6 x 9 (TAPER)	
710	3-977-443-01	WASHER, STOPPER		723	3-979-508-01	SCREW + HEXA TP SW 3 x 8	
711	A-6759-863-B	PRESS BLOCK ASSY, PINCH		724	3-059-958-01	SPRING, TG8	
712	3-958-455-01	SPRING (PINCH), TENSION		725	3-051-300-03	LOCK ACE SCREW	
713	3-977-447-01	GEAR, ELEVATOR		#2	7-685-646-79	SCREW + BVTP 3 x 8 TYPE2 IT-3	

7-1-4. MECHANISM DECK SECTION-2



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
751	X-3947-581-4	BRAKE ASSY,MAIN(T)		762	X-3944-378-1	ROLLER ASSY, GUIDE	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)		763	3-965-178-01	SPRING	
753	X-3947-573-1	ARM ASSY, PENDULUM		764	3-062-687-01	BASE, DRUM	
754	X-3947-580-5	BRAKE ASSY, MAIN(S)		765	A-6750-328-G	SHUTTLE (T) BLOCK ASSY	
755	3-977-513-02	LEVER, REC PROOF		766	3-977-501-01	PLATE, LUMINOUS	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)		767	A-6746-074-G	ROLLER BLOCK ASSY, HC	
757	3-977-487-01	BOSS, TG1 FULCRUM		768	X-3947-255-1	ROLLER ASSY, HC	
758	X-3947-587-1	TG1 ASSY		769	3-975-724-07	ARM, HC	
759	X-3947-589-1	BAND ASSY, TG1		770	8-839-047-53	DRUM ASSY, DZH-0A0A/Z-RP	(LX60S/LX70S)
760	3-977-488-01	SPRING (POWER TENSION)		770	8-839-049-53	DRUM ASSY, DZH-0A2A/Z-RP	(LX40/LX50)
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY		#2	7-685-646-79	SCREW + BCTP 3 x 8 TYPE IT-3	
				#3	7-682-647-09	SCREW + P3 x 6	

7-1-5. MECHANISM DECK SECTION-3



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR		819	3-977-455-01	GEAR, LOADING(T)	
802	X-3947-584-1	ASSY, REEL DIRECT		820	3-977-456-03	SPRING, TORSION (LOAD T)	
803	3-977-443-01	WASHER, STOPPER		821	X-3947-579-1	LEVER ASSY, LOADING(T)	
804	3-977-438-01	WORM - WHEEL		822	3-977-451-01	GEAR, LOADING(S)	
805	3-977-506-01	ARM, LIMITTER SELECTION		823	3-977-452-01	SPRING, TORSION (LOAD S)	
806	3-977-444-01	GEAR, PINCH TRANSMISSION		824	X-3947-578-1	LEVER ASSY, LOADING (S)	
807	3-977-515-01	GUIDE, FL SLIDER		825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
808	3-977-517-01	PLATE, SLIDE, FL		826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)		827	3-977-467-02	SPRING, CAP BRAKE	
810	3-977-518-02	PLATE, LIMITTER, FL		828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
811	3-977-516-01	HOLDER, FL SLIDER		829	3-977-489-01	ARM, TG1 DRIVING	
812	3-977-877-01	PLATE, RETAINER		830	A-6759-616-A	GEAR BLOCK ASSY, LOADING (S)	
813	3-977-504-01	GEAR, CLUTCH		831	1-766-723-21	CONNECTOR, BOARD TO BOAR 3P	
814	X-3947-585-1	GEAR ASSY, PULLEY		832	3-977-436-01	WORM	
815	3-977-510-01	BELT, RUBBER		833	3-989-917-01	SPACER (REC PROOF)	
816	3-056-824-01	WASHER, STOPPER		M902	1-698-971-11	MOTOR, DC (CAPSTAN)	
817	3-977-439-01	GEAR, CAM		M903	X-3947-577-1	MOTOR ASSY, CAM (LOADING)	
818	3-977-442-03	SLIDER		#2	7-685-646-79	SCREW + BVTP 3 x 8 TYPE IT-3	
				#4	7-685-133-19	SCREW + P2.6 x 6 TYPE2 NON-SLIT	

7-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked “**” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **CAPACITORS:**
uF: μ F

- **RESISTORS**
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- **COILS**
uH: μ H
- **SEMICONDUCTORS**
In each case, u: μ , for example:
uA...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...

When indicating parts by reference number, please include the board name.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque  sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description		Remarks	Ref. No.	Part No.	Description		Remarks
	A-6794-813-A	D1-080 BOARD MOUNT		*****			<RESISTOR>		
CN901	1-770-514-31	CONNECTOR, FFC/FPC 5P			R801	1-216-295-00	SHORT	0	
		<SWITCH>			R802	1-216-295-00	SHORT	0 (LX60S/LX70S)	
S901	1-418-156-11	ENCODER, ROTARY			R803	1-216-022-00	RES-CHIP	75 5%	1/10W
		<SWITCH>			R805	1-216-053-00	RES-CHIP	1.5K 5%	1/10W
		<SWITCH>			R806	1-216-013-00	RES-CHIP	33 5%	1/10W
	A-6794-814-A	FJ-032 BOARD MOUNT (LX60S/LX70S)							
	A-6794-815-A	FJ-032 BOARD MOUNT (LX40/LX50)		*****					
		<CAPACITOR>							
C803	1-163-009-11	CERAMIC CHIP	0.001µF	10%	C805	1-163-009-11	CERAMIC CHIP	0.001µF	10%
		(LX60S/LX70S ONLY)							50V
C806	1-163-009-11	CERAMIC CHIP	0.001µF	10%					50V
		<CONNECTOR>							
CN801	1-568-852-11	CONNECTOR, FFC/FPC 9P							
		<JACK>							
CNJ801	1-785-622-11	JACK, PIN 2P (LX40/LX50)							
CNJ801	1-770-021-11	JACK, PIN 3P (LX60S/LX70S)							
		<DIODE>							
D801	8-719-071-15	DIODE HZM6.8ZWA1TL							
D802	8-719-071-15	DIODE HZM6.8ZWA1TL							
D803	8-719-422-37	DIODE MA8051-TX							
D804	8-719-071-15	DIODE HZM6.8ZWA1TL							
		<CHIP CONDUCTOR>							
JR801	1-216-296-00	SHORT	0						
		<JUMPER SELECTOR>							
JS801	1-216-295-00	SHORT	0 (LX40/LX50)						

Ref. No.	Part No.	Description			Remarks	Ref. No.	Part No.	Description			Remarks
C143	1-126-965-11	ELECT	22μF	20%	50V	C237	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C144	1-126-965-11	ELECT	22μF	20%	50V	C238	1-124-589-11	ELECT	47μF	20%	16V
C145	1-126-935-11	ELECT	470μF	20%	10V	C239	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C146	1-164-161-11	CERAMIC CHIP	0.0022μF	10%	50V	C240	1-124-589-11	ELECT	47μF	20%	16V
C160	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V	C241	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C161	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V	C242	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C162	1-163-038-00	CERAMIC CHIP	0.1μF		25V	C243	1-162-306-11	CERAMIC	0.01μF	20%	16V
C163	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V	C244	1-109-982-11	CERAMIC CHIP	1μF	10%	10V
C164	1-163-102-00	CERAMIC CHIP	24PF	5%	50V	C245	1-109-982-11	CERAMIC CHIP	1μF	10%	10V
C165	1-163-102-00	CERAMIC CHIP	24PF	5%	50V	C246	1-162-306-11	CERAMIC	0.01μF	20%	16V
C166	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	C247	1-163-037-11	CERAMIC CHIP	0.022μF	10%	50V
C167	1-163-233-11	CERAMIC CHIP	18PF	5%	50V	C248	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V
C168	1-124-584-00	ELECT	100μF	20%	10V	C249	1-109-982-11	CERAMIC CHIP	1μF	10%	10V
C169	1-163-038-00	CERAMIC CHIP	0.1μF		25V	C250	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V
C170	1-163-137-00	CERAMIC CHIP	680PF	5%	50V	C251	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C171	1-127-737-11	DOUBLE LAYER	0.33F		5.5V	C252	1-162-306-11	CERAMIC	0.01μF	20%	16V
C172	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C253	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C173	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C254	1-109-982-11	CERAMIC CHIP (LX60S/LX70S)	1μF	10%	10V
C176	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C255	1-164-004-11	CERAMIC CHIP (LX60S/LX70S)	0.1μF	10%	25V
C185	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C267	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C187	1-164-346-11	CERAMIC CHIP	1μF		16V	C271	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C188	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C272	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C190	1-124-589-11	ELECT	47μF	20%	16V	C275	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C201	1-163-809-11	CERAMIC CHIP	0.047μF	10%	25V	C276	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C202	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C278	1-163-037-11	CERAMIC CHIP	0.022μF	10%	50V
C203	1-163-275-11	CERAMIC CHIP (LX40/LX50)	0.001μF	5%	50V	C279	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C204	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C280	1-124-584-00	ELECT	100μF	20%	10V
C205	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C281	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C206	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C282	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C207	1-163-241-11	CERAMIC CHIP	39PF	5%	50V	C283	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C208	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C284	1-164-489-11	CERAMIC CHIP	0.22μF	10%	16V
C209	1-124-589-11	ELECT	47μF	20%	16V	C285	1-162-306-11	CERAMIC	0.01μF	20%	16V
C210	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C286	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C211	1-163-239-11	CERAMIC CHIP	33PF	5%	50V	C301	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C213	1-163-131-00	CERAMIC CHIP	390PF	5%	50V	C302	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C214	1-163-257-11	CERAMIC CHIP	180PF	5%	50V	C303	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C215	1-163-227-11	CERAMIC CHIP	10PF	0.50PF	50V	C304	1-104-664-11	ELECT	47μF	20%	25V
C216	1-126-160-11	ELECT	1μF	20%	50V	C305	1-104-664-11	ELECT	47μF	20%	25V
C217	1-163-037-11	CERAMIC CHIP	0.022μF	10%	50V	C306	1-163-037-11	CERAMIC CHIP	0.022μF	10%	50V
C220	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C307	1-124-257-00	ELECT	2.2μF	20%	50V
C221	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C308	1-164-346-11	CERAMIC CHIP	1μF		16V
C222	1-126-157-11	ELECT	10μF	20%	16V	C309	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C223	1-124-234-00	ELECT	22μF	20%	16V	C310	1-126-964-11	ELECT	10μF	20%	50V
C224	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C311	1-124-257-00	ELECT	2.2μF	20%	50V
C225	1-126-160-11	ELECT	1μF	20%	50V	C312	1-126-964-11	ELECT	10μF	20%	50V
C226	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C313	1-126-964-11	ELECT	10μF	20%	50V
C227	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C314	1-126-964-11	ELECT	10μF	20%	50V
C228	1-124-589-11	ELECT	47μF	20%	16V	C315	1-126-964-11	ELECT	10μF	20%	50V
C229	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C316	1-109-979-81	ELECT	3.3μF	10%	50V
C230	1-163-038-00	CERAMIC CHIP	0.1μF		25V	C317	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C231	1-124-589-11	ELECT	47μF	20%	16V	C318	1-126-162-11	ELECT	3.3μF	20%	50V
C232	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C319	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C233	1-126-157-11	ELECT	10μF	20%	16V	C320	1-126-163-11	ELECT	4.7μF	20%	50V
C234	1-109-982-11	CERAMIC CHIP	1μF	10%	10V	C321	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C235	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C322	1-126-157-11	ELECT	10μF	20%	16V
C236	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V						

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
C323	1-126-163-11	ELECT	4.7μF	20%	50V	C503	1-163-017-00	CERAMIC CHIP	0.0047μF	10%	50V
C324	1-109-978-81	ELECT	10μF	10%	16V	C504	1-163-275-11	CERAMIC CHIP	0.001μF	5%	50V
C325	1-126-163-11	ELECT	4.7μF	20%	50V	C505	1-162-199-31	CERAMIC	10PF	5%	50V
C326	1-124-242-00	ELECT	33μF	20%	25V	C507	1-163-137-00	CERAMIC CHIP	680PF	5%	50V
C327	1-126-160-11	ELECT	1μF	20%	50V	C508	1-109-982-11	CERAMIC CHIP	1μF	10%	10V
C328	1-126-157-11	ELECT	10μF	20%	16V	C509	1-163-016-00	CERAMIC CHIP	0.0039μF	10%	50V
C329	1-126-157-11	ELECT	10μF	20%	16V	C510	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C330	1-163-023-00	CERAMIC CHIP	0.015μF	10%	50V	C511	1-163-038-00	CERAMIC CHIP	0.1μF	25V	
C331	1-124-242-00	ELECT	33μF	20%	25V	C512	1-124-584-00	ELECT	100μF	20%	10V
C332	1-124-589-11	ELECT	47μF	20%	16V	C513	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V
C333	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C514	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V
C334	1-164-489-11	CERAMIC CHIP	0.22μF	10%	16V	C561	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C336	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C562	1-104-664-11	ELECT	47μF	20%	25V
C337	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C563	1-126-935-11	ELECT	470μF	20%	10V
C338	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C564	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V
C339	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C570	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C340	1-163-023-00	CERAMIC CHIP	0.015μF	10%	50V	C571	1-109-982-11	CERAMIC CHIP	1μF	10%	10V
C341	1-126-157-11	ELECT	10μF	20%	16V	C572	1-126-163-11	ELECT	4.7μF	20%	50V
C342	1-126-157-11	ELECT	10μF	20%	16V	C573	1-110-501-11	CERAMIC CHIP	0.33μF	10%	16V
C343	1-164-489-11	CERAMIC CHIP	0.22μF	10%	16V	C574	1-126-157-11	ELECT	10μF	20%	16V
C345	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C575	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C350	1-126-160-11	ELECT	1μF	20%	50V	C576	1-124-584-00	ELECT	100μF	20%	10V
C351	1-104-664-11	ELECT	47μF	20%	25V	C577	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C352	1-163-038-00	CERAMIC CHIP	0.1μF	25V		C578	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C353	1-126-160-11 (LX40/LX50)	ELECT	1μF	20%	50V	▲ C600	1-104-705-11	MYLAR	0.1μF	20%	250V
C354	1-126-157-11	ELECT	10μF	20%	16V	▲ C601	1-104-705-11	MYLAR	0.1μF	20%	250V
C355	1-126-160-11 (LX40/LX50)	ELECT	1μF	20%	50V	▲ C602	1-113-900-11	CERAMIC	470PF	10%	250V
C356	1-124-242-00	ELECT	33μF	20%	25V	▲ C603	1-113-900-11	CERAMIC	470PF	10%	250V
C357	1-126-163-11	ELECT	4.7μF	20%	50V	▲ C604	1-113-900-11	CERAMIC	470PF	10%	250V
C358	1-126-160-11	ELECT	1μF	20%	50V	▲ C605	1-127-932-41	ELECT	150μF	20%	400V
C359	1-163-009-11	CERAMIC CHIP	0.001μF	10%	50V	▲ C605	1-119-882-51	ELECT(BLOCK)	120μF	20%	200V
C360	1-163-014-00	CERAMIC CHIP	0.0027μF	10%	50V	C606	1-130-470-00	MYLAR	820PF	5%	50V
C362	1-124-589-11	ELECT	47μF	20%	16V	C607	1-107-737-11	MYLAR	560PF	5%	50V
C363	1-126-163-11	ELECT	4.7μF	20%	50V	▲ C608	1-131-974-11	FILM	2200PF	5%	800V
C364	1-126-157-11	ELECT	10μF	20%	16V	C610	1-137-921-11	ELECT	1500μF	20%	10V
C365	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C611	1-126-935-11	ELECT	470μF	20%	16V
C366	1-126-160-11	ELECT	1μF	20%	50V	C612	1-126-160-11	ELECT	1μF	20%	50V
C368	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C613	1-130-496-00	MYLAR	0.12μF	5%	50V
C369	1-126-163-11 (LX40/LX50)	ELECT	4.7μF	20%	50V	C615	1-131-976-21	ELECT	820μF	20%	25V
C371	1-163-135-00	CERAMIC CHIP	560PF	5%	50V	C616	1-126-941-11	ELECT	470μF	20%	25V
C380	1-137-374-11	MYLAR	0.047μF	5%	50V	C621	1-124-234-00	ELECT	22μF	20%	16V
C381	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C624	1-126-967-11	ELECT	47μF	20%	50V
C382	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C626	1-126-967-11	ELECT	47μF	20%	50V
C383	1-124-589-11	ELECT	47μF	20%	16V	C627	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C405	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C629	1-135-372-31	ELECT	470μF	20%	10V
C406	1-124-584-00	ELECT	100μF	20%	10V	C630	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C422	1-124-589-11	ELECT	47μF	20%	16V	C631	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C423	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V	C636	1-126-935-11	ELECT	470μF	20%	16V
C424	1-163-038-00	CERAMIC CHIP	0.1μF	25V		C660	1-124-589-11	ELECT	47μF	20%	16V
C425	1-126-157-11	ELECT	10μF	20%	16V	C661	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V
C427	1-164-004-11	CERAMIC CHIP	0.1μF	10%	25V	C662	1-126-965-11	ELECT	22μF	20%	50V
C500	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	C664	1-104-664-11	ELECT	47μF	20%	25V
C501	1-163-231-11	CERAMIC CHIP	15PF	5%	50V	C665	1-124-234-00	ELECT	22μF	20%	16V
C502	1-164-232-11	CERAMIC CHIP	0.01μF	10%	50V						

Note :
The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

Note :

The components identified by mark \triangle or dotted line with mark

mark  or dotted line with  are critical for safety.

▲ are critical for safety.
Replace only with part number
specified.

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
JR007	1-216-295-00	SHORT	0	JS324	1-216-296-00	SHORT	0 (LX40/LX50)
JR008	1-216-295-00	SHORT	0	JS325	1-216-295-00	SHORT	0 (LX40/LX50)
JR009	1-216-295-00	SHORT	0	JS453	1-216-295-00	SHORT	0
JR010	1-216-295-00	SHORT	0	JS521	1-216-295-00	SHORT	0 (LX40/LX50)
JR011	1-216-295-00	SHORT	0	JS603	1-216-296-00	SHORT	0
JR012	1-216-295-00	SHORT	0	JS604	1-216-296-00	SHORT	0
JR013	1-216-295-00	SHORT	0	JS616	1-216-296-00	SHORT	0
JR014	1-216-295-00	SHORT	0				<COIL>
JR015	1-216-295-00	SHORT	0	L101	1-414-179-51	INDUCTOR	2.2μH
JR016	1-216-295-00	SHORT	0	L161	1-414-185-51	INDUCTOR	22μH
JR017	1-216-295-00	SHORT	0	L162	1-414-185-51	INDUCTOR	22μH
JR018	1-216-295-00	SHORT	0	L163	1-414-185-51	INDUCTOR	22μH
JR101	1-216-296-00	SHORT	0	L201	1-414-946-21	INDUCTOR	39μH
JR102	1-216-296-00	SHORT	0	L202	1-414-857-51	INDUCTOR	100μH
JR103	1-216-296-00	SHORT	0	L203	1-414-856-51	INDUCTOR	10μH
JR104	1-216-296-00	SHORT	0	L204	1-414-857-51	INDUCTOR	100μH
JR105	1-216-296-00	SHORT	0	L205	1-414-857-51	INDUCTOR	100μH
JR106	1-216-296-00	SHORT	0	L206	1-414-857-51	INDUCTOR	100μH
JR107	1-216-296-00	SHORT	0	L207	1-414-193-51	INDUCTOR	220μH
JR108	1-216-296-00	SHORT	0	L270	1-414-857-51	INDUCTOR	100μH
JR109	1-216-296-00	SHORT	0	L303	1-414-857-51	INDUCTOR	100μH
JR110	1-216-296-00	SHORT	0	L380	1-414-857-51	INDUCTOR	100μH
JR111	1-216-296-00	SHORT	0	L420	1-414-185-51	INDUCTOR	22μH
JR112	1-216-296-00	SHORT	0				<COIL>
JR113	1-216-296-00	SHORT	0	L500	1-414-930-21	INDUCTOR	2.2μH
JR114	1-216-296-00	SHORT	0	L501	1-414-857-51	INDUCTOR	100μH
JR115	1-216-296-00	SHORT	0	L561	1-414-857-51	INDUCTOR	100μH
JR116	1-216-296-00	SHORT	0	L570	1-414-857-51	INDUCTOR	100μH
JR117	1-216-296-00	SHORT	0	L601	1-403-588-11	INDUCTOR	22μH
JR118	1-216-296-00	SHORT	0	L602	1-403-588-11	INDUCTOR	22μH
JR119	1-216-296-00	SHORT	0	L603	1-414-142-11	INDUCTOR	1μH
JR120	1-216-296-00	SHORT	0	L604	1-414-142-11	INDUCTOR	1μH
JR121	1-216-296-00	SHORT	0	L606	1-414-142-11	INDUCTOR	1μH
JR122	1-216-296-00	SHORT	0	L660	1-410-519-11	INDUCTOR	68μH
JR123	1-216-296-00	SHORT	0	L703	1-414-179-51	INDUCTOR	2.2μH
JR124	1-216-296-00	SHORT	0	L704	1-414-179-51	INDUCTOR	2.2μH
JR125	1-216-296-00	SHORT	0				<FILTER>
JR126	1-216-296-00	SHORT	0				
JR127	1-216-296-00	SHORT	0				
JR128	1-216-296-00	SHORT	0				
JR129	1-216-296-00	SHORT	0	▲ LF600	1-416-929-11	FILTER, LINE	
JR130	1-216-296-00	SHORT	0				<FLUORESCENT INDICATOR TUBE>
JR131	1-216-296-00	SHORT	0				
JR132	1-216-296-00	SHORT	0				
JR133	1-216-296-00	SHORT	0	ND420	1-517-925-11	TUBE, FLUORESCENT INDICATOR	
JR134	1-216-296-00	SHORT	0				<PHOTO COUPLER>
JR135	1-216-296-00	SHORT	0				
JR136	1-216-296-00	SHORT	0				
JR137	1-216-296-00	SHORT	0				
JR138	1-216-296-00	SHORT	0	▲ PH101	8-749-015-86	PHOTO INTERRUPTER GP3S120S	
JR139	1-216-296-00	SHORT	0	▲ PH102	8-749-015-86	PHOTO INTERRUPTER GP3S120S	
				▲ PH600	8-749-010-64	PHOTO COUPLER PC123FY2	
							<JUMPER SELECTOR>
							<IC LINK>
JS304	1-216-295-00	SHORT	0	▲ PS101	1-532-727-11	LINK, IC 0.25A/150V	
JS323	1-216-295-00	SHORT	0 (LX40/LX50)	▲ PS662	1-533-710-11	FUSE (SMD)	

Note :
The components identified by mark ▲ or dotted line with mark ▲ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description		Remarks	Ref. No.	Part No.	Description		Remarks
<TRANSISTOR>									
Q101	8-729-043-84	TRANSISTOR PT380F3			R166	1-216-073-00	RES-CHIP	10K	5% 1/10W
Q102	8-729-043-84	TRANSISTOR PT380F3			R167	1-249-431-11	CARBON	15K	5% 1/4W
Q103	8-729-281-53	TRANSISTOR 2SC1815GR-TPE2			R168	1-216-073-00	RES-CHIP	10K	5% 1/10W
Q201	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			R169	1-216-073-00	RES-CHIP	10K	5% 1/10W
Q202	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			R170	1-247-843-11	CARBON	3.3K	5% 1/4W
Q203	8-729-216-21	TRANSISTOR 2SA1162Y-TE85L			R171	1-216-089-00	RES-CHIP	47K	5% 1/10W
Q204	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX (LX60S/LX70S)			R172	1-216-073-00	RES-CHIP	10K	5% 1/10W
Q301	8-729-216-21	TRANSISTOR 2SA1162Y-TE85L			R174	1-216-039-00	RES-CHIP	390	5% 1/10W
Q302	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			R175	1-249-413-11	CARBON	470	5% 1/4W
Q303	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L			R176	1-249-413-11	CARBON	470	5% 1/4W
Q304	8-729-281-53	TRANSISTOR 2SC1815GR-TPE2			R177	1-249-413-11	CARBON	470	5% 1/4W
Q351	8-729-230-49	TRANSISTOR 2SC2712Y-TE85L (LX40/LX50)			R178	1-216-105-91	RES-CHIP	220K	5% 1/10W
Q380	8-729-821-15	TRANSISTOR 2SD1620-TD			R179	1-216-113-00	RES-CHIP	470K	5% 1/10W
Q500	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX			R180	1-216-061-00	RES-CHIP	3.3K	5% 1/10W
Q502	8-729-216-21	TRANSISTOR 2SA1162Y-TE85L			R183	1-216-295-00	SHORT	0	
Q561	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX			R185	1-216-295-00	SHORT	0	
Q600	8-729-047-92	TRANSISTOR 2SB1398-Q(TA).SO			R187	1-216-295-00	SHORT	0	
Q601	8-729-422-27	TRANSISTOR 2SD601A-QRS-TX			R188	1-216-069-00	RES-CHIP	6.8K	5% 1/10W
Q662	8-729-019-01	TRANSISTOR 2SD2394-EF			R189	1-216-061-00	RES-CHIP	3.3K	5% 1/10W
Q673	8-729-119-78	TRANSISTOR 2SC3311A-RTA			R191	1-249-417-11	CARBON	1K	5% 1/4W
Q674	8-729-106-68	TRANSISTOR 2SD1664-T100-R			R192	1-249-417-11	CARBON	1K	5% 1/4W
<RESISTOR>									
R101	1-249-413-11	CARBON	470	5% 1/4W	R193	1-216-295-00	SHORT	0	
R102	1-216-077-91	RES-CHIP	15K	5% 1/10W	R194	1-216-073-00	RES-CHIP	10K	5% 1/10W
R103	1-216-077-91	RES-CHIP	15K	5% 1/10W	R201	1-216-037-00	RES-CHIP	330	5% 1/10W
R104	1-249-433-11	CARBON	22K	5% 1/4W	R202	1-216-047-91	RES-CHIP	820	5% 1/10W
R105	1-249-433-11	CARBON	22K	5% 1/4W	R203	1-216-037-00	RES-CHIP	330	5% 1/10W
R106	1-249-400-11	CARBON	39	5% 1/4W	R204	1-216-071-00	RES-CHIP	8.2K	5% 1/10W
R107	1-249-400-11	CARBON	39	5% 1/4W	R205	1-208-830-11	METAL CHIP	100K	0.5% 1/10W
R109	1-249-437-11	CARBON	47K	5% 1/4W	R208	1-216-295-00	SHORT	0	
R110	1-216-089-00	RES-CHIP	47K	5% 1/10W	R209	1-216-067-00	RES-CHIP	5.6K	5% 1/10W
R111	1-216-057-00	RES-CHIP	2.2K	5% 1/10W	R210	1-216-053-00	RES-CHIP	1.5K	5% 1/10W
R112	1-216-065-00	RES-CHIP	4.7K	5% 1/10W	R211	1-216-065-00	RES-CHIP	4.7K	5% 1/10W
R113	1-216-073-00	RES-CHIP	10K	5% 1/10W	R212	1-216-043-91	RES-CHIP	560	5% 1/10W
R114	1-216-073-00	RES-CHIP	10K	5% 1/10W	R213	1-216-049-00	RES-CHIP	1K	5% 1/10W
R115	1-216-089-00	RES-CHIP	47K	5% 1/10W	R214	1-216-053-00	RES-CHIP	1.5K	5% 1/10W
R116	1-216-089-00	RES-CHIP	47K	5% 1/10W	R215	1-216-071-00	RES-CHIP	8.2K	5% 1/10W
R117	1-216-041-00	RES-CHIP	470	5% 1/10W	R216	1-249-420-11	CARBON	1.8K	5% 1/4W
R118	1-216-089-00	RES-CHIP	47K	5% 1/10W	R219	1-247-807-31	CARBON	100	5% 1/4W
R119	1-216-077-91	RES-CHIP	15K	5% 1/10W	R220	1-216-295-00	SHORT	0	
R120	1-249-417-11	CARBON	1K	5% 1/4W	R221	1-216-295-00	SHORT	0	
R121	1-249-413-11	CARBON	470	5% 1/4W	R223	1-216-045-00	RES-CHIP	680	5% 1/10W
R142	1-216-051-00	RES-CHIP	1.2K	5% 1/10W	R224	1-216-089-00	RES-CHIP	47K	5% 1/10W
R143	1-216-065-00	RES-CHIP	4.7K	5% 1/10W	R225	1-216-045-00	RES-CHIP	680	5% 1/10W
R159	1-216-097-11	RES-CHIP	100K	5% 1/10W	(LX60S/LX70S)				
R160	1-216-049-00	RES-CHIP	1K	5% 1/10W	R231	1-216-089-00	RES-CHIP	47K	5% 1/10W
R161	1-216-073-00	RES-CHIP	10K	5% 1/10W	R267	1-216-295-00	SHORT	0	
R162	1-249-419-11	CARBON (LX60S/LX70S)	1.5K	5% 1/4W	R270	1-216-041-00	RES-CHIP	470	5% 1/10W
R164	1-216-089-00	RES-CHIP	47K	5% 1/10W	R271	1-216-041-00	RES-CHIP	470	5% 1/10W
R165	1-216-089-00	RES-CHIP	47K	5% 1/10W	R272	1-208-788-11	METAL CHIP	1.8K	0.5% 1/10W
					R274	1-216-061-00	RES-CHIP	3.3K	5% 1/10W
					R276	1-216-069-00	RES-CHIP	6.8K	5% 1/10W
					R277	1-216-081-00	RES-CHIP	22K	5% 1/10W
					R278	1-216-081-00	RES-CHIP	22K	5% 1/10W
					R279	1-216-081-00	RES-CHIP	22K	5% 1/10W
					R301	1-249-417-11	CARBON	1K	5% 1/4W
					R302	1-216-049-00	RES-CHIP	1K	5% 1/10W
					R303	1-216-049-00	RES-CHIP	1K	5% 1/10W
					R305	1-216-033-00	RES-CHIP	220	5% 1/10W

Ref. No.	Part No.	Description			Remarks	Ref. No.	Part No.	Description			Remarks
R306	1-216-033-00	RES-CHIP	220	5%	1/10W	R427	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R308	1-216-091-00	RES-CHIP	56K	5%	1/10W	R440	1-216-075-00	RES-CHIP	12K	5%	1/10W
R310	1-216-295-00	SHORT	0			R441	1-216-085-00	RES-CHIP	33K	5%	1/10W
R311	1-216-295-00	SHORT	0			R445	1-216-049-00	RES-CHIP	1K	5%	1/10W
R313	1-249-437-11	CARBON	47K	5%	1/4W	R500	1-216-049-00	RES-CHIP	1K	5%	1/10W
R314	1-216-089-00	RES-CHIP	47K	5%	1/10W	R502	1-216-295-00	SHORT	0		
R316	1-216-085-00	RES-CHIP	33K	5%	1/10W	R503	1-249-417-11	CARBON	1K	5%	1/4W
R318	1-249-437-11	CARBON	47K	5%	1/4W	R504	1-216-049-00	RES-CHIP	1K	5%	1/10W
R319	1-216-089-00	RES-CHIP	47K	5%	1/10W	R505	1-216-045-00	RES-CHIP	680	5%	1/10W
R321	1-216-061-00	RES-CHIP	3.3K	5%	1/10W	R507	1-216-041-00	RES-CHIP	470	5%	1/10W
R323	1-216-295-00	SHORT	0			R508	1-216-053-00	RES-CHIP	1.5K	5%	1/10W
R350	1-216-093-91	RES-CHIP	68K	5%	1/10W	R509	1-216-121-11	RES-CHIP	1M	5%	1/10W
R351	1-216-067-00	RES-CHIP	5.6K	5%	1/10W	R512	1-216-295-00	SHORT	0		
R352	1-249-439-11	CARBON	68K	5%	1/4W	R513	1-249-413-11	CARBON	470	5%	1/4W
	(LX40/LX50)					R561	1-216-037-00	RES-CHIP	330	5%	1/10W
R353	1-216-067-00	RES-CHIP	5.6K	5%	1/10W	R562	1-249-407-11	CARBON	150	5%	1/4W
	(LX40/LX50)					R563	1-249-408-11	CARBON	180	5%	1/4W
R354	1-216-129-00	RES-CHIP	2.2M	5%	1/10W	R564	1-216-021-00	RES-CHIP	68	5%	1/10W
R355	1-249-439-11	CARBON	68K	5%	1/4W	R565	1-216-022-00	RES-CHIP	75	5%	1/10W
R356	1-216-067-00	RES-CHIP	5.6K	5%	1/10W	R570	1-208-806-11	METAL CHIP	10K	0.5%	1/10W
	(LX40/LX50)					R571	1-249-413-11	CARBON	470	5%	1/4W
R357	1-216-071-00	RES-CHIP	8.2K	5%	1/10W	R572	1-249-413-11	CARBON	470	5%	1/4W
R358	1-216-055-00	RES-CHIP	1.8K	5%	1/10W	R573	1-216-071-00	RES-CHIP	8.2K	5%	1/10W
R359	1-216-065-00	RES-CHIP	4.7K	5%	1/10W	R574	1-216-049-00	RES-CHIP	1K	5%	1/10W
R362	1-216-051-00	RES-CHIP	1.2K	5%	1/10W	R575	1-249-425-11	CARBON	4.7K	5%	1/4W
R363	1-216-079-00	RES-CHIP	18K	5%	1/10W	R576	1-216-097-11	RES-CHIP	100K	5%	1/10W
R364	1-216-035-00	RES-CHIP	270	5%	1/10W	R577	1-216-097-11	RES-CHIP	100K	5%	1/10W
R365	1-216-109-00	RES-CHIP	330K	5%	1/10W	R601	1-214-949-21	METAL	3.3M	1%	1/2W
R366	1-216-071-00	RES-CHIP	8.2K	5%	1/10W	R602	1-247-883-00	CARBON	150K	5%	1/4W
R367	1-216-067-00	RES-CHIP	5.6K	5%	1/10W	R603	1-247-891-00	CARBON	330K	5%	1/4W
R369	1-216-047-91	RES-CHIP	820	5%	1/10W	R604	1-249-430-11	CARBON	12K	5%	1/4W
R370	1-216-075-00	RES-CHIP	12K	5%	1/10W	R605	1-249-419-11	CARBON	1.5K	5%	1/4W
R371	1-216-079-00	RES-CHIP	18K	5%	1/10W	R606	1-215-444-00	METAL	9.1K	1%	1/4W
R372	1-216-043-91	RES-CHIP	560	5%	1/10W	R607	1-249-428-11	CARBON	8.2K	5%	1/4W
R373	1-249-417-11	CARBON	1K	5%	1/4W	▲ R611	1-260-364-11	CARBON	1M	5%	1/2W
	(LX40/LX50)					R612	1-208-789-11	METAL CHIP	2K	0.5%	1/10W
R380	1-216-017-91	RES-CHIP	47	5%	1/10W	R613	1-249-406-11	CARBON	120	5%	1/4W
R381	1-216-063-91	RES-CHIP	3.9K	5%	1/10W	R614	1-216-655-11	METAL CHIP	1.5K	0.5%	1/10W
R382	1-217-671-11	RES-CHIP	1	5%	1/10W	R615	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R383	1-216-031-00	RES-CHIP	180	5%	1/10W	R616	1-249-401-11	CARBON	47	5%	1/4W
R401	1-216-025-11	RES-CHIP	100	5%	1/10W	R617	1-249-417-11	CARBON	1K	5%	1/4W
R402	1-249-437-11	CARBON	47K	5%	1/4W	R618	1-249-409-11	CARBON	220	5%	1/4W
R407	1-216-013-00	RES-CHIP	33	5%	1/10W	R621	1-249-429-11	CARBON	10K	5%	1/4W
R409	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R622	1-216-430-11	METAL OXIDE	390	5%	1W
R410	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R623	1-247-843-11	CARBON	3.3K	5%	1/4W
R411	1-216-059-00	RES-CHIP	2.7K	5%	1/10W	▲ R640	1-219-153-11	FUSIBLE	10	5%	1/4W
R412	1-216-075-00	RES-CHIP	12K	5%	1/10W	▲ R641	1-219-153-11	FUSIBLE	10	5%	1/4W
R413	1-216-077-91	RES-CHIP	15K	5%	1/10W	R643	1-216-353-00	METAL OXIDE	2.2	5%	1W
R415	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R647	1-215-465-00	METAL	68K	1%	1/4W
R416	1-216-053-00	RES-CHIP	1.5K	5%	1/10W	R648	1-216-057-00	RES-CHIP	2.2K	5%	1/10W
R417	1-216-057-00	RES-CHIP	2.2K	5%	1/10W	R649	1-216-017-91	RES-CHIP	47	5%	1/10W
R418	1-216-059-00	RES-CHIP	2.7K	5%	1/10W	R651	1-215-459-00	METAL	39K	1%	1/4W
R422	1-249-417-11	CARBON	1K	5%	1/4W	R669	1-216-061-00	RES-CHIP	3.3K	5%	1/10W
R423	1-249-417-11	CARBON	1K	5%	1/4W	R676	1-249-417-11	CARBON	1K	5%	1/4W
R424	1-249-417-11	CARBON	1K	5%	1/4W	R678	1-249-409-11	CARBON	220	5%	1/4W
R425	1-216-095-00	RES-CHIP	82K	5%	1/10W	R679	1-249-409-11	CARBON	220	5%	1/4W

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MA-405

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